GLEANINGS IN BEE CULTURE

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H. H. ROOT, Assistant Editor.
A. I. ROOT, Editor Home Department.
E. R. ROOT, Editor.
A. L. BOYDEN, Advertising Manager.
J. T. CALVERT, Business Manager.

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EDITORIAL

By E. R. ROOT.

DR. D. E. LYON, of Monroe, N. Y., one of our field editors, has had three visitations of death in his family in the short space of ten days, consisting of mother, son, and an invalid friend. We extend our sincere sympathy in his great bereavement. Were it not for "the grace of God," he says, he would not be able to bear it.

"LOCALITY" AN OVERWORKED WORD.

MR. E. N. MILES, in a recent letter, referring to the clover discussion in GLEANINGS, says, "I have been greatly impressed by the influence of locality on this matter. It is well known that locality is a very hard word in a bee-keepers' discussion, and that many a fine theory is wrecked thereon" Very true.

DEATH OF MR. W. BROUGHTON CARR.

WE are very sorry to announce the death, on Feb. 11, of Mr. W. Broughton Carr, for many years an editor of the *British Bee Journal*. He was the inventor of the "W. B. C." hive so much used in England. He also invented the well-known English "metal ends" for frames. Long ago he advocated shallow frames for surplus honey, and lived to see them come into quite common use. For a number of years he was sole editor of the *Bee-keepers' Record*, and otherwise did much to advance the cause of scientific bee-keeping in his own country.

INSTRUCTIONS FOR BEGINNERS.

WE desire to call attention to the series of articles beginning in this issue, on "Practical Instructions for Beginners," by E. D. Townsend. The details of the business will be given in these articles, and we are sure that much of the matter will be interesting, not only to the beginner, but to the expert as well. Mr. Townsend gives full particulars on starting with bees, selection of equipment, transferring, etc., and since he has made a success in bee-keeping himself, he is entirely capable of pointing out the way to others. From a practical standpoint, we believe that these articles will fill a long-felt want in giving a *detailed* account of what at least one successful bee-keeper did.

FALL DROUTHS USUALLY NOT HURTFUL TO CLOVERS.

THE reader will be interested in the general summary made from letters that have been sent us during the last few weeks, as to whether the drouth of last fall had so killed out the clovers that there will be no clover honey this summer. We know of no question that is more important or of more absorbing interest than this one. If the clovers should all be killed out, for all time, GLEANINGS and all the other bee-papers would have to suspend publication and the bee-supply factories would have to shut up shop. Therefore it will be of some comfort to our readers to feel that the conditions thus far have not been unfavorable (at least in most localities) for a flow of clover honey.

A FOUL-BROOD LAW FOR INDIANA AT LAST.

THE following, just received from Walter S. Pouder, will explain itself:

Friend Ernest:—Just this minute I have a phone message from our State Entomologist notifying me that our foul-brood measure has become a law. I think Indiana bee-keepers now have much reason to rejoice. I have worked hard for the measure, but felt uneasy about it because some of our law-makers have done some very strange things, and no one could predict what would happen. Much of the credit belongs to Mr. M. J. Niblack, of Vincennes; Mr. Douglass, and yourself. Your letters had an important bearing. WALTER S. POUDER.

Indianapolis, March 5.

In addition to the names mentioned, Mr. Pouder did some very efficient work. Indeed, it is not too much to say that he began the agitation and kept it up until victory was secured. As for ourselves, we only did our duty, and what we are doing for *all* States that are trying to secure bee-disease laws. We are glad to write letters to committees and to law-makers alike. As editor of this journal we know the facts and the needs.

OUR NORTHWEST CORRESPONDENT.

A FEW days ago we had a visit from one of our western correspondents, Mr. E. F. Atwater, of Meridian, Idaho. He is a young man, scarcely thirty, rather under stature, and not blessed, as we would say, with a strong and robust constitution, but we believe that our readers will agree with us he is one of the best writers we have. He is now working about 750 colonies of bees. He is a close and careful student, and an enthusiast in all he undertakes. We are frank to confess that we gathered not a few valuable pointers from him while he was here. He has a fine camera, and is prepared to give us glimpses, not only into his workshop, but out in the field, where he finds pleasure and profit from his bees.

BEES READY TO TAKE OUT OF THE CELLAR.

IN most localities bees should come out of their indoor winter quarters by this time, especially if they are uneasy. If, however, they appear to be wintering well, and are quiet, we advise holding them in for at least two weeks more. Dr. Miller's rule, to keep the bees in until the soft maples furnish pollen, is a good one for most localities; but if the bees fly out of the

entrances in the cellar, or appear to be covering the bottom of the cellar to a considerable extent, or if all of them are more or less uneasy, or begin to "roar," we would not keep them in the cellar one day longer, although we would try to hold off until there is a possibility for the bees to fly.

A GREAT SURPLUS OF ARTICLES FOR PUBLICATION.

NEVER before in all our experience have we had so much good matter awaiting its turn for publication. We have almost enough on hand at present to keep the journal running for six months, even if we didn't get any more. As will be observed, we are enlarging our journal; but even this extra space will probably not enable us to get in all the good matter on time—that is, so it will be seasonable. As it is, some of it will have to wait till next yext or be left out altogether.

We would request our correspondents to make their communications as brief as possible, and omit all preliminaries or explanations. Get right down to the kernel of the matter. We are obliged to trim or cut down much of what we do publish.

OUR PRINTING DEPARTMENT RUSHED

OUR printing department has been rushed away beyond its capacity. Certain of our booklets are now out of print. The series of Alexander articles, which we hoped to put in book form, are not yet out, and probably will not be for a month yet. Those of our readers who have placed orders for these books and booklets will bear with us a little longer. We are ordering special machinery by telegraph to increase our output. Our presses are now running overtime, but we hope to be caught up inside of about six weeks.

The 1907 edition of the A B C and X Y Z of Bee Culture, of 15,000 copies, that was taken off the press a little over a year ago, is going at a rapid rate, and probably will not hold out until the next edition is ready for delivery. We felt that, when we put up our large and magnificent forty-thousand-dollar printing-plant with its new equipment and machinery, we should be able to take care of any demand that might be made on us; but already it is taxed beyond its capacity.

Later.—We just placed an order for nearly $3000 worth of new printing machinery, consisting of two automatic press-feeders. These will not only increase our output but effect a great saving in the cost of feeding and in the loss of spoiled sheets.

USELESS TARIFF ON LUMBER; DANGER THAT IT WILL BE RETAINED.

THE lumber interests of the country are making a desperate effort for the retention of the duty of $2.50 to $3.00 on their product. It is said that it has the largest lobby in Washington of any of the great interests in the country. We are also told that those interests have already entertained 150 members of Congress at a big dinner; of sumptuous banquets given to scores of other national officials, and that they are even now boasting that they have enough men "won over" so that the present tariff will be retained.

If the American people allow a tariff on a commodity that is becoming more and more scarce, without a protest, they will have only themselves to blame. We urgently request every one of our readers to write to their Representative and their Senators, asking them to use their influence, both in committees and on the floor of the House and Senate, for the repeal of the tariff on lumber. *Do it now ere it is too late.* While you are about it, write to the Hon. Sereno E Payne, chairman of the Ways and Means Committee, to the same effect.

It has been well said that, if there is a *single* industry in the United States that does *not* now require protection, and should not have it, it is lumber. It can have no other effect than to protect the *few* and compel the *masses* to pay more for every thing made of wood. The available supply in the United States is limited to very small areas. There is no reason why the big output in Canada should not come to the United States free of duty.

HONEY PROSPECTS NEXT YEAR AND PRICES; WILL IT BE SAFE TO HOLD OVER CLOVER EXTRACTED FOR BETTER PRICES?

As reports begin to come in from different parts of the country we find there are scattering localities where white clover has been killed out entirely by the drouth of last fall; but, so far as we can ascertain, in the great majority of places this valuable plant is coming up smiling, and doubtless will be ready to give us a big crop this season. Unless weather conditions change materially, the bee-keeper who is holding over his white-clover honey, thinking there will be a scarcity for the next season, is making a mistake. While we do not anticipate by any means a large clover yield, such as we had last year, yet we believe that such honey will be very much in evidence in most markets during the coming summer. And even if it should be much scarcer than usual, the prospects for a big crop from California were never better. Colorado had a rather indifferent season during 1908, but she will probably more than make up the deficit of last year with a crop this season. The conditions in Texas are exceedingly favorable, so that, taking conditions as they appear, any one who is holding back his extracted honey hoping for a new and better market during the coming summer is taking chances, although a first quality of strictly pure clover, without any other flavor, will always have a good market, and at fair prices.

Of course, the white clover that has not been killed out in our north-central States may yet get a setback. There may be a drouth at just the wrong time of the year. But this is hardly possible in view of the severity of the drouth last summer and fall. Nature is not likely to give us two drouths so near together.

DID THE DROUTH OF LAST FALL KILL THE CLOVERS? AN INTERESTING COLLECTION OF FACTS FROM MANY SOURCES TO SHOW THAT IT DID NOT.

IN response to requests for information on this subject we received a large number of letters and articles. We only regret that we have not the necessary space to publish them all, as some of them are very interesting and valuable. About

all we can do is to give a summary of the conclusions made by a few of them.

It is remarkable with what unanimity nearly all of them agree; and it is no less remarkable how they support the statement made by our neighboring farmer, Mr. Adam Leister, whose views were reported on pages 48 and 96, to the effect that the clovers had not been killed by the drouth.

As we glean from this pile of letters, we find that there are two kinds of winter-killing. One is known as the "heaving-out" process, by which the alternate freezing and thawing of a water-soaked soil breaks the roots of the clovers, dismembering them until there seems but little of them left The other kind of winter-killing is from what might be called the dry process. In this the ground is frozen to a great depth, freezing the roots and plants solid While it may thaw and freeze somewhat, it is claimed that "the severe cold wind blowing over the surface when the ground is not protected, if it continues for any length of time, will kill almost any clover." But on the other hand it is claimed that white clover suffers less from winter-killing than any of the clovers. Unlike the common red, peavine, and alsike, it has no great tap-root. It is essentially a vine like the strawberry, having shallow roots at frequent intervals shooting down into the ground for short distances. During the heaving process of winter-killing, the white clovers are lifted up and down, and apparently are but little harmed by the process except in cases where there is very severe cold without snow that attacks root and branch alike.

Referring to the effect of drouth, one writer in particular draws attention to the fact that, the drier it is in the fall, up to a certain limit, and the more prolonged, the more the root system is strengthened and the more it grows. If this drouth is followed by winter or spring rains, such as we have been having this year, the plants will grow amazingly.

As to being able to prognosticate a flow of honey from white clover, nearly all the writers scout the very idea. Conditions, they say, may be ideal in the fall, and in the succeeding winter and spring; but if they are not ideal at the time the clover is in bloom, even though the fields may be white with it, there will be little or no clover honey. Nearly all the writers agree that clover has freaks of yielding enormously some years and failing almost entirely in others. Most of them assert that a drouth in the fall is not hurtful, but beneficial, providing *other conditions that follow* are favorable. All acknowledge that a drouth may be so severe that the clover may be killed and is killed; but the reports from various sections of the country show that the drouth of last fall killed the clovers in only limited areas.

The majority assert that in most localities the conditions last fall were not unfavorable, and that the conditions during the past winter and so far in March have been very favorable; but they are not equally positive that we shall have a clover-flow—that no man knows what Dame Nature will do at that season of the year when the plant is required to give up its precious sweets to the world.

Attention is called to the fact that some years ago a prominent writer made the positive prediction that we could depend on a crop of honey from clover if we only have deep snows in winter. Referring to this, one correspondent says, in the winter of 1907 they had comparatively little snow, and yet there was a bumper crop in the summer of 1908; and then he adds, "As an actual fact, the amount of clover honey is not measured by the quantity of bloom; for I have seen the fields white with an abundance of bloom, but only a fair crop. I can remember one year when we had a great scarcity of bloom, and yet we had a good crop of clover honey. I have also seen, as Mr. Doolittle and Dr. Miller have said, fields white with clover, but no honey." He then goes on to say that he has seen the clover parched by drouth in June—not a blossom in sight, and at the very time of year when there should be bloom if ever. Then a series of soaking rains came on, and, presto! bloom and a crop of honey. This same man makes a further statement that is worth recording here. He winds up by saying, "In the fall and latter part of the summer of 1897 or '8 we had a very dry time—not as dry as last fall, but dry enough—so dry that it was spoken of as being remarkably so. . . . I had a bumper crop the following summer." This man is George Shiber, of Randolph, N. Y.; and if we had the space we would use the whole article.

Another writer, Mr. John McLauchlan, of London, Canada, confirming the quotation just made, says:

> The fall of 1899 or 1900, I forget which, was exceptionally dry in this district right through from August 15 until winter set in. This was followed by a very dry spring with very little grass of any kind until the later part of May, when a series of warm rains commenced which continued almost daily until about the 20th of June. The effect was marvelous. By the end of June the fields and roadsides were one beautiful mass of white clover and alsike, and the honey crop was the best my memory can recall. JOHN MCLAUCHLAN.
>
> London, Canada, Feb. 22.

Mr. E. Lamont, of New Dover, Ohio, says: "Late summer and fall drouths, as a rule, harm clovers but little . . . I doubt if, in the long run, the conditions brought about by last year's dry spell are a damage to the bee-keepers of the white-clover districts;" and then, implying that a wet fall is too much of a good thing, he adds: "I am satisfied that a rank growth of clover at any time, except white clover, does not yield the nectar that it otherwise would. This is proven conclusively in the case of red and alsike clovers that are cut for seed, as there is never so much seed on the low ground, where the growth is rankest." And then he concludes by saying that he believes it is an advantage, in point of nectar secretion, that clovers should have an occasional setback by drouth.

Taking it all in all, the weight of testimony is to the effect that bee-keepers who depend on clover for their honey have not so much to fear from a drouth in the fall as from winter-killing or drouth during June; but even then white clover, nine years out of ten, will stand a heaving of the soil that would kill red and alsike.

Another writer makes the point that damage done by a severe drouth will usually be repaired providing we get in time some good soaking rains. If the spring rains are all followed by a severe drouth, clovers will be killed outright.

We have endeavored to give here the essential facts of all this mass of testimony. It speaks for itself.

STRAY STRAWS

DR. C. C. MILLER, MARENGO, ILL.

UNCAPPING with an upward stroke has been getting out of style lately; but W. A. Chrysler, p. 130, makes it look all right when done his way.

SOME DAY there will be an uncapping-knife made with two handles like a drawing-knife. [We doubt whether such a knife will ever be practicable.—ED.]

ULRICH KRAMER, the indefatigable Swiss bee-master, has been titled "Ehrendoktor" by the University of Bern. Congratulations, Herr Praesident Dr. Kramer!

C. B. PALMER, page 140, asks in what part of the super to put bait sections when we do not use an excluder. Frankly, I don't know. I generally put one in the center of the first super. If plenty are on hand it might be better to put one at each corner.

F. DUNDAS TODD, p. 141, has put a blight upon my young life which I may never outgrow. To think that, without a word of warning, he would let me go on and do all those dreadful things, and then hold me up as an "awful example" afteward! I have my opinion of such a man.

G. M. DOOLITTLE, you've made a good lay-out for the bees, page 126. But why omit soft maple? Coming so much earlier, isn't it worth three times as much as hard maple? Then I should want dandelion—worth more than apple-bloom here, and we have lots of apple-bloom too. You say basswood *after* the clovers. Here basswood, what little there is of it, comes *in* clover-bloom.

R. F. HOLTERMANN, we mustn't always draw general conclusions from a single datum. What is true for M. A. Fouré, p. 123, does not settle all. There is no disputing that the flight of bees is affected by the position of the sun. I've often noticed that, in rather cool air, bees in the sun would be flying, and those in the shade still. Enticing them to fly may be a good thing—it may be a bad thing—depends on circumstances.

F. W. REDFIELD, p. 133, says, "If honey must be sold at a reduction, then why not to outside States to the large dealers, rather than to the leading merchants of the home town?" That's all right if your honey nets you more by shipping to the other State. But that "If honey must be sold at a reduction" sounds as if he would send to an outside State, even at a loss. But how about the other fellow? If he follows the same rule and ships into your State at a loss, where are you?

M. H. MENDLESON, you're right, p. 128, that top-bars sag with vertical wiring. Before horizontal wiring was known I had hundreds of frames wired vertically, and some top-bars sagged badly. But the foundation didn't sag; and with horizontal wiring I think foundation stretches at the top more than is generally noticed—although the queen notices it and doesn't use it. Better avoid both errors and use vertical splints. [We shall be glad to get reports from those who have used the splints. Thousands of them were made and sold last season and the year before. Frankly, we have been afraid the bees would gnaw around them, as was shown in the Atwater frame shown on page 1127, Sept. 15th issue of last year. —ED.]

WAX PRODUCTION, is it involuntary? Certainly, I think, in some cases. Stuff a bee with honey, and make it stay stuffed, and likely you are as sure of wax as you are of milk when you stuff a cow with pumpkins. But under ordinary conditions, if the bee doesn't want wax she disgorges the honey, and the cow doesn't disgorge the pumpkins. Take two strong swarms, side by side, in a bumper season, equal in every respect. Give to the one fully drawn combs for brood-chamber and supers, and give to the other not even a foundation starter. The one without combs may fill supers enough so that, if all the combs are melted up, there will be, say, 10 lbs. of wax. If wax production is entirely voluntary, the other colony also produces 10 lbs. Where is it? R. C. Aikin accounts for it, p. 62, by saying it is made into burr-combs, filled into cracks, etc. Do you really believe they use 10 lbs. of it in that way?

Let x represent the number of pounds of wax obtainable from the combs given to the first colony if they had been melted at the time of giving. Let y represent the wax obtained from *all* the combs of the second colony at the close of the season. At the close of the season, also render all the combs of the first colony. If the secretion of wax is the same in each case, the total wax from the first colony must be $x + y$. In other words, from the first colony you will get as much wax as from the other, plus the wax that was originally in the combs given. Has that ever been achieved? [You admit that bees would secrete wax involuntarily if compelled to retain the honey. In the time of a honey-flow, especially basswood, is it not generally considered that the bees consume very largely of their product? If you feed bees for stimulation, and measure up the amount fed by the amount stored, there is a loss. Has it not been pretty well proven that the amount of honey that the bees actually store is by no means as large as the amount they actually gather? Of course, we know there is a vast shrinkage by the evaporation of water in the nectar as well as a loss of that used for brood-rearing, but even leaving that out of the account, there is a loss. Well, this loss must be accounted for by the fact that the bees consume it. If they grow fat on it, why should they not involuntarily secrete wax scales? But you ask what becomes of the wax. It is dropped in the form of scales which (the bees being too busy to gather up) is left there and wasted. Has it not been proven that there are large numbers of wax scales in the dirt on the bottom-board during and immediately after a honey-flow?

We are not supporting the theory that bees secrete wax involuntarily *under all conditions*. We believe there are enough data already to make us believe that, under many conditions at least, wax is secreted involuntarily, and, if not used in comb-building, it is actually wasted. We hope some experiment station will test this matter by a series of careful experiments. The dirt from the bottom-board should be carefully examined and analyzed.—ED.]

GLEANINGS FROM OUR EXCHANGES

By W. K. Morrison, Medina, O.

Several European bee-journals have made mention of the death of Mr E. W. Alexander. They take great pleasure in chronicling the "fact" that he had an apiary of 1200 colonies of bees. Mr. A. never claimed to have more than 750.

OKRA AS A HONEY-PLANT.

There is a prospect that this excellent southern vegetable, so dear to the heart of soup-makers, will be far more extensively planted than formerly. It has been found to be excellent for paper-making, as the stalks are very fibrous. It is a very fair honey-plant; and should it be grown on an extensive scale it will be a valuable asset to bee-keepers. The okra grows fairly well at Medina—that is, the improved kinds grown for their pods.

PURE FOOD IN FRANCE.

In September last there was held at Geneva, Switzerland, an international congress for the suppression of food frauds. One of the measures decided on was an international system of uniform names or definitions for food products. The man asked to define honeys, honey-bread, sugars, glucoses, etc., is M. Silz, expert chemist to the French Court of Appeals. As Dr. Wiley was honorary president of that congress, doubtless he will soon inform us what is the definition of the word "honey." European bee-keepers are just as well pleased with the new pure-food laws as Americans are.

THE BEST HARNESS-DRESSING.

Three ounces of turpentine and two ounces of refined beeswax are dissolved together over a slow fire. Then add one ounce of ivory black and a dram of indigo, well pulverized and mixed together. When the wax and turpentine are dissolved, add the ivory black and indigo, and stir till cold. Apply very thin. Wash afterward, and you will have a beautiful polish. This blacking keeps the leather soft. It is excellent for buggy-tops and harness. In England a large amount of beeswax is used by the makers of harness-dressing. The above is the usual recipe.

BEES IN GUADALOUPE; DO THEY WORK ON COCOA AND COFFEE?

Mr. Holtermann refers to the fertilizing power of bees on cocoa and coffee in Guadaloupe—see page 123. This statement has been repeated for many years, and the Dutch government hired Mr. Frank Benton to take some bees out to Java for that very purpose, thinking, no doubt, that what was feasible in Guadaloupe would work out fairly well in the East Indies. The worst of it is, that there are very few "honey bees" in Guadaloupe, and not so very long ago I was there and found none. Moreover, our bees seldom notice cocoa-blossoms. I have watched cocoa for years, and never saw them on it; but others have told me they did visit it, and possibly in some places they do. There are quite a good many stingless bees in Guadaloupe, and they visit cocoa somewhat. As to coffee, bees go fairly wild over its beautiful snow-like blossoms; but it blooms only 24 to 48 hours, hence they can not get a crop from it. This refers to Arabian coffee. Liberian blossoms longer.

The trouble, I believe, is that Guadaloupe is not a good place to grow cocoa. It is too windy, and much of the soil is not fit for it. By the way, *cocoa* is habitually misspelled. The proper way is cacao, pronounced kak-cow.

REAL CORN SYRUP.

An effort is being made by Prof. F. L. Stewart, of Murrysville, Pa., to interest the commercial world in the manufacture of sugar from the ordinary Indian corn. By preventing the stalk from forming ears, the plant becomes a sugar producer almost equal to sugar-cane. He says the sugar content is about 13 per cent, equivalent to 200 lbs. of sugar per ton, which is about the same as the proportions in sugar cane. The "corn syrup" sold in most grocery stores is not made from corn, but from starch, and *any* starch will answer the purpose. Syrup from corn would compete with honey, but such a competitor would be just and fair.

WAX IN PLANTS.

Allusion has been made on a former occasion to the abundance of wax in the sugar-cane plant Long ago a New Orleans apothecary proved it was closely allied to beeswax in composition. Later studies show wax is quite common in the vegetable world. Mr. Edward Step, in his new book, "The Living Plant," has this to say of it: "Wax is another frequent vegetable production, especially in the torrid zone, where many of the wax-bearing plants supply the natives with light. This substance gives the bloom to the plum cherry, and grape; and 'the raindrops lie on the waxy surface of the cabbage-leaf like balls of diamond, from the total reflection of the light at their point of contact.' Wax is secreted in the cuticle for the purpose of getting rid as rapidly as possible of the water which is deposited on the surface of the leaves, or to prevent excessive loss of water by transpiration." Evidently wax cuts a big figure in this old world of ours. Further on the same author says: "The delicate waxen bloom of many plants presents some curious forms under the microscope. The bloom on the rye, familiarized in a popular song, consists of dense agglomerations of rods or needles of wax, and is a most interesting object for examination. So, too, is the wax coating of the leaves of the banana (*Musa*), which consists of little rods which stand erect on the cuticle like so many Lilliputian posts, while the "frosting" of the leaves of many lilies is made up of tiny granules of wax." I am decidedly of the opinion that beeswax will play a far larger part in the industries of the future than it has hitherto. What we want is a "square deal." Something will have to be done with such substitutes as paraffine and ozokerite before the production of beeswax will stand on a sound basis. Let us have the provisions of the pure food laws applied to all "shoddy" goods.

BEE-KEEPING IN THE SOUTHWEST

BY LOUIS SCHOLL, NEW BRAUNFELS, TEX.

"Spring cleaning" should be more in vogue among bee-keepers. Now is the time for it. Those who clean up the apiary, honey-house, and every thing else before the busy season, and have every thing in apple-pie order, will have a smooth path to travel the rest of the season; the others, a rough one.

That book about honey, p. 54, is of much interest to me. It will be remembered that my desire was to see a book about honey published like that on beeswax by Mr. Cowan. Now we have one, but in German. But, say, to whom must I send my 75 cents? [Send to the publisher, A. Hartleben, Leipzig, Germany.—ED.]

A PLEA FOR SHALLOW FRAMES

Say, Mr. Crane, come down and we'll take off honey together, p. 100. Several have been here who doubted my record (?), but, fortunately for me, went away. Yes, the shallow-frame supers have many advantages *if used rightly*. But there are many who do not agree with me. It is not inconvenient to have the shallow supers over regular Langstroth-frame brood-chambers; but why not have the same thing throughout—shallow-frame bodies for brood-chambers, section-supers, extracting-supers, and all, as we do?

SHALLOW FRAMES DON'T NEED WIRING.

A tedious job is that of having to string your frames with wire. It's not only a waste of time, but an extra expense. The only way we overcome this is by the use of shallow frames and a divisible hive. No wire is needed in these frames, which are only 5⅜ inches deep; and not only is the wire saved, but *lighter* grades of foundation can be used, which means a great saving in that respect. Thin super foundation is used for full sheets, and extra-thin can be used for starters. As proof of this we shall have over 25,000 of these frames in use this season. We are nailing up several shipments of such frames now, and find all the end-bars pierced with holes for wires, and wire and small nails included, making only an extra expense, which can be saved.

PAINTING HIVES.

Since such fellows as Dr. Miller and others have caused several (perhaps many) bee-men not to waste time and money in painting their hives I have thought it worth while to experiment, and two seasons' use of unpainted hives is enough for me. Of course, the southern conditions may have a lot to do with it. All kinds of lumber not protected by paint will twist, warp, check, and split. This can *not* be tolerated in a bee-hive. A little extra expense and time will not only keep the hives neat in appearance, but hold them together. It is much more agreeable to work with the painted ones. Dr. Miller would rather throw his unpainted hives away when making a change to some other style, since the old ones would be too much worn out any way. I would keep them from wearing out by painting, and then sell them for more than enough to pay for the paint.

"SHAKING BEES," AGAIN.

Yes, don't go "crazy" about shaking bees, p. 74. I differ with Geo. W. Williams in this respect. He shakes the bees helter-skelter off the combs and out of the hives—shakes them all to pieces in front of the hives, and lets them crawl in again; and they are only too glad to get back and restore things to rights. He gets the effect, but he goes too far. First, it seems cruel to me to treat them so severely, and then say, "Now, go to work, be gads, or I'll shake ye again." Besides, it takes lots of time, and could hardly be practiced with a thousand colonies. I know that frequent "shakings" of a colony will make them work better; but instead of going to the extreme I make use of this stirring-up at various times of the season when we are manipulating the hives for certain reasons. A few of these are mentioned, p. 102. This kind of "shaking" pays.

A BOOK ON HONEY-PLANTS.

A "botany of honey-flowers" would be a great thing for us bee-keepers, page 79; but have you thought what size such a volume would make, Grant Stanley? You say the book should contain every possible known honey and pollen producing plant in America. It should be durably bound, and of convenient size to carry in the pocket." But why have a pocket size? If one considers how many large volumes are needed for the botany of different parts of the United States alone, and the great number of plants, etc., which would fall under the above list of honey-flowers, it is at once apparent that a botany of the honey-plants of America would make a very large volume indeed. My *preliminary list* of Texas honey-plants alone, as published by the Texas Experiment Station, is very brief, and contains only a part of the honey-plants here, yet it numbers 31 pages the size of GLEANINGS.

THE EFFECT OF THE AGE OF HONEY ON THE QUALITY.

That honey will keep forever has been a general belief by most of us, and I have often repeated the statement that, the older honey gets, the better it is. I have heard of "a barrel of honey twenty years old, and better than when first stored away." Now, it appears that opinions differ on this subject. About two dozen bottles of honey that were put up at different temperatures in a honey-heating experiment at A. and M. College several years ago I find have changed very materially in every case. It was some of my best honey, put up after being heated at temperatures varying from 128° to 180° Fahr. There were several of each temperature, all labeled and tightly sealed; and the most remarkable part of it is that there is a great difference in the contents of bottles of the same temperature. None of it resembles the good quality of honey bottled, and the levulose and dextrose have separated in each. All is very dark.

SIFTINGS.

By J. E. CRANE, MIDDLEBURY, VT.

Those who fail to read the Home department of GLEANINGS for Jan. 1 will miss some of the best things between the covers.

Dr. Miller, p. 50, gives 82.6 as the per capita consumption of sugar in the United States. Now will he give us the per capita consumption of honey?

Mr. Holtermann, page 20, Jan. 1, says that, with abundance of rain, alsike sown in spring sometimes comes into bloom the same season, but rarely yields much honey. Same here.

The testimony of J. Enclund, p. 39, Jan. 1, is the first positive statement I have seen on feeding beet sugar where it was positively known that the sugar was from beets. Not so bad, after all.

Mr. Holtermann, p. 1428, recommends cotton batting for stopping up leaks in hives, especially when moving. His head is level. There is nothing better. I have used it for the last twenty years when needed.

On page 50, Dr. Miller suggests wisely that there may be a difference in the time of sealing up queen-cells. I believe he is right, and that bees often seal queen larvæ before they are nearly grown.

Mr. Morrison, on page 22, Jan. 1, refers to the advice of some one as to keeping surplus honey on hives late in the season, and he says it will granulate, etc. He might have added that it will condense the moisture rising from the brood-nest, and the condensation on the surplus combs will be absorbed by the honey, thereby injuring its quality.

Page 48, Jan. 15, ye editor asks if the plan of shaking to increase the working energy of bees is a joke. I think not; or if it is, the joke is on the bees, for I have found, as a rule, it increases their efficiency. It is no uncommon thing to find that such colonies, after robbing them of their brood-combs, giving them empty ones instead, store more than those by their side undisturbed.

HONEY VS. CANDY CONSUMPTION.

Dr. Miller informs us, p. 18, Jan. 1, that if the people of this country only ate honey as they do candy, then a population of 3000 would consume 25,000 lbs. of honey. Well, doctor, I will tell you what will go a long way toward doing it. When bee-keepers and honey-dealers put up their honey in as small and attractive packages as the confectioners do, it will help more than the most of us are accustomed to think. We sell hundreds (I think I might say thousands) of pounds of honey that retails for 40 cts. a pound, and it is no better than other honey we sell for 12½ cts., simply because it is in small attractive packages.

Page 18, Jan. 1, Dr. Miller inquires, "Doesn't your honey-board make more even work in sections, etc.?" Yes, sir. I have noticed it; but as a rule I have put the honey-board on too late to receive the full benefit in this direction. Since that article appeared illustrating my honey-board I have been informed that Mr. Harbison, of California, used just such a board for the express purpose of getting his sections filled more evenly, and that it was a complete success for that purpose.

Will the drouth affect the clover for next season? Yes and no. In some sections where the drouth was very severe, and especially on clay soil, the white clover is practically all dead. But where there were some showers there seemed at the beginning of winter considerable clover. [See editorial discussion elsewhere.—ED.] Alsike clover will stand more drouth and freezing in winter or spring than white clover. But there appears to be some compensation. Such severe drouths as last year seem to bring up to the surface, or within the reach of plants, elements of fertility that are not usually within reach; and flowers, what there are, may yield honey more abundantly as a result of the drouth.

E. D. Townsend tells us, p. 24, that the main advantage of a capping-melter, as he sees it, is the saving of honey that usually goes to waste, and represents his loss as three or four hundred pounds annually. I do not believe so much waste is necessary. It is an easy matter to melt cappings in a double boiler and then separate the honey from wax without harm to either. Or they can be melted up with water, and the diluted honey fed back to the bees. [It is true that cappings may be melted in a double boiler, and the honey and wax separated; but if there are *barrels* of cappings the time required is considerable. It would be cheaper to arrange the double boiler so that the cappings will fall into it direct from the knife so that they will not need to be handled again —ED.]

On page 22 Mr. Morrison objects to my objection to calling honey, diluted with water, honey cider. I will tell you why. Cider has been used to such an extent here in New England for tippling purposes that it is no credit to honey to be confounded with that word. Besides, the dictionary limits the use of the word cider to the juice of fruits, principally of apples. He says, "We speak of apple cider, peach cider, pear cider, quince cider, etc. Why not honey cider?" I answer, because honey and water mixed is not the juice of fruits; and, further, because, if we could say honey cider, then a mixture of sugar or molasses and water would be sugar cider or molasses cider. How do you like it? My mother used to make vinegar out of these mixtures. Honey and water will make quite as good vinegar without calling the mixture cider as it will to give it that name. It is quite different with vinegar which is derived from various sources, and so we have the terms cider vinegar, malt vinegar, wine vinegar, beet-root vinegar, beer vinegar, honey vinegar, etc.

CONVERSATIONS WITH DOOLITTLE

AT BORODINO, NEW YORK

UNDERSTANDING OUR LOCALITY.

"Mr. Doolittle, not long ago you told how your bees gathered pollen and honey from certain trees and plants, and I came over this morning to ask you how you know that these things give the honey. How can you tell that the bees are not stealing the honey from the hives of other bees or from some grocer's sugar-barrel?"

"Well, Mr. Stevens, allow me to ask you how you know that the English sparrows eat wheat."

"That is easy enough! I have seen them eat wheat with my chickens."

"Yes. And I have seen the bees gathering pollen and nectar from all of the plants and trees about which I have written, and I am just as confident about the matter as you are that the English sparrows eat wheat."

"Do you think it necessary for a man to know about the sources from which his bees obtain their pollen and nectar?"

"I certainly do. One of the most important factors of successful bee-keeping is a thorough knowledge of the locality. Many bee-keepers do not seem to realize the importance of this, as their actions show; for if they did we should not hear so often of those who delayed making hives and sections till the surplus season was on, or of those who delayed putting on the supers till the best part of the honey season was over, or of those equally unwise who add the surplus room so early in the season that their colonies are greatly injured by the great amount of room when there are but few bees in the hives below."

"Then you think such things should be studied into by the beginner?"

"I think all work with the bees, if successfully done, should be done with an eye open to the probable time of the blossoming of the main nectar-producing plants and trees in the locality. Of course, the pollen part is not so necessary to know about, except when some tree or plant is likely to give an excess of pollen as the hard maple does in this part of York State. Then it is well to open the hives at the close and remove frames solid with pollen to give to colonies deficient in the same when a scarcity comes later."

"But how do you prepare for any known crop of nectar so as to help matters any?"

"All bee-keepers worthy of the name know that the queen is the mother bee, and lays all the eggs from which the bees eventually come. After the egg is deposited in the cell, it takes approximately three days for it to incubate, when a larva hatches from the egg. As soon as hatched, this larva is fed by the nurse bees for approximately six days, when it has grown so as nearly to fill the cell. At this time the cell is capped over, and this larva undergoes the changes necessary for it to emerge from the cell a perfect bee, which it does in about twelve days from the time the cell was sealed over, or approximately twenty-one days from the time the queen laid the egg in the cell."

"Yes; but bees are hatching at all times of the year, except winter; so what has that got to do with the matter?"

"Take, for ins ance, the blossoming of white clover, which we will suppose is our main nectar-producing plant in our locality. To get the bees in good condition for it, we must commence operations with them at least six weeks previous to its blossoming, for it takes at least six weeks to build up a colony so it will be able to do the best work on a given field of blossoms. Hence, as white clover blossoms in this locality about June 16 we must commence to secure our bees for this harvest as early as the first of May."

"But I thought you said that it took only twenty-one days from the time the egg was laid till the perfect bee emerges from the cell."

"So I did. But this perfect bee takes six days to straighten up to where it is ready for a flight from the hive, when a colony is in a normal condition, and ten days more of inside work before it has grown to a full-fledged field worker, while the greatest number of field workers is not obtained for a week to ten days longer."

"But all do not have white clover."

I know they do not. Suppose the yield came from basswood, which opens from July 10 to 15, there being no more clover than is needed to keep up brood-rearing; then commencing to stimulate the bees for this harvest as early as May 1 would be labor and stores thrown away, as the useless expenditure of honey needed in producing bees to loaf around waiting for the basswood harvest would detract just so much from the success we desire to attain. If we have a field of grain to cut, requiring the labor of twenty men to harvest it, we would not hire these men two to three weeks before the grain is ripe, feeding and paying them during the time; and we should learn to use common sense in regard to the bees the same as we do in other things. When we are told to commence to feed and stimulate the bees as early as possible in the spring, it is well to know what these bees can secure from such stimulation; and if nothing is ready for them to harvest, let us leave the stimulation alone till the resulting bees can work to advantage in the harvest. Again, if we do not get the bees ready for the harvest till after it is over, it would be like hiring the twenty men after the grain had become ripe and had spoiled on the ground. We should have to pay them and feed them when there was nothing for them to do. So the man who brings the greatest number of bees on the stage of action at any period of honey dearth wastes all the stores necessary for their production, as they become merely consumers instead of producers. They are worse than useless."

"But we must have a lot of bees in the colony at all times of the year, must we not?"

"If by this 'lot' you mean enough to insure the rapid building-up of the colony in time to take advantage of any honey-flow I would say yes. But if you mean that the colony should be up to its maximum strength at all times without regard to the one, two, or three seasons of surplus from *known* sources, then I say we shall be feeding a promiscuous multitude with no definite end in view. It seems plain to me that, to be the most successful as apiarists, we must have a full force of bees at just the right time to take advantage of the harvest; and in order to do this we must study our locality and know the blooming time of the flowers which give us our surplus."

BEE-SONG.

BY THERON BROWN.

I suck the dews of May and June
  When blossom-time is young;
All summer long you hear my tune
  In spicy gardens sung;
September days I swim amid
  The buckwheat's milky foam,
But—never lost and never hid—
  I know the bee-line home.

Sometimes where plum or peach begins
  To blush I love to stay,
Or pasture-mint or thistle wins
  My flight a mile away.
A thousand circles I describe,
  Yet never where I roam
Forget my master and my tribe,
  Nor miss the bee-line home.

Praise pinks and milkweeds to the bee,
  Wild rose and goldenrod,
Or call the fragrant basswood-tree
  The honey-maker's god.
But banks of bloom could ne'er delay
  The call that bids me come,
Nor tempt the hive-born heart astray
  That knows the bee-line home.

There brim the crystal nectar-cups,
  The pollen-cakes are clean,
There, soothed with tender music, sups
  The brown-eyed castle queen.
What wonder that I longing seek
  My walls of flowery comb
And quit the balmiest posy's cheek
  To wing the bee-line home?

Ye bees that walk on human feet,
  You hurry everywhere,
But straight for you a shining street
  Leads homeward through the air.
To find it in your evening flight,
  Unlost amid the gloam,
Have you the light that burns at night,
  And shows the bee-line home?

—Courtesy Christian Endeavor World.

GENERAL CORRESPONDENCE

PRACTICAL INSTRUCTIONS FOR BEGINNERS.

How I Became a Successful Manager of Bees on a Large Scale.

BY E. D. TOWNSEND.

One day in June, 1876, my younger brother and sister coming from school saw a swarm of bees fly overhead. I can remember it as well as though it were yesterday, how I found fault with them for not telling me until after the swarm was out of sight. Probably fifteen or twenty minutes had elapsed after the bees had passed over the road; and since colonies in movable-frame hives were worth $10.00 in those days, and since I had had the bee fever for some two years, I made up my mind to locate that swarm. I was shown where it c ossed the road and the direction it took. Before I had gone into the woods ten rods I heard the bees entering a tree, and I soon saw them, for many were still on the outside, while others were circling around making a great noise. They entered a limb well up toward the top of a large elm.

That night I asked a bee-keeper when it would be best to transfer the bees from the tree to a frame hive, and he told me that I could do no better than to do it immediately, for the reason that, if the tree were felled before the bees had time to build any comb they could be hived like a natural swarm, without the inconvenience of transferring sticky combs, etc. A third of a century has elapsed since this took place; and if I were asked to-day how to manage in such a case I would give the same answer that this bee-keeper gave me Well, the tree was cut while the bees were flying during the next day; and although their entrance had been 60 ft from the ground not a bee was lost; for as soon as those in the tree started into the new hive, all of the bees heard the "homing hum" and entered the new hive with the rest.

As soon as the tree was down, and before the bees got over being demoralized, the bee-keeper who was helping me ran toward the top of the tree; and as soon as he could locate the entrance he smoked the bees so that they could be handled without fear of stings. By sawing in on each side of the entrance, and splitting off a portion of the limb, we opened the cavity where the bees were. The hive was then placed with the entrance as near as possible to the part where most of the bees were, and with a tin dipper the greater part of them were dipped up and emptied at the hive entrance. By the time we had most of the bees dipped out of the tree in front of the new hive there was this loud "homing" call as the bees commenced running in. At this point of the procedure the few bees that were left in the tree were smoked until they took wing, and then we stepped back so as to be out of the way. All of the flying bees, attracted by the loud hum, soon entered the new hive, which was moved home that night when all flying was over for the day.

It occurs to me to mention here the fact that any beginner noticing a swarm issuing should not rush off to a neighbor for a hive, leaving the swarm clustered, for, as likely as not, the bees will be gone on his return. The better way is to hive them in a soap-box or any thing else, for that matter, that can be used temporarily, and, when hived, the box should be set on the stand where it is to remain until the new hive can be brought. Then, as soon as the new hive is obtained, he should go to the swarm in the box and blow some smoke in at the entrance in order to avoid stings. (A beginner should wear a veil until he is thoroughly acquainted with the bees, simply so that he will not be nervous.)

As soon as the new hive is ready the box should be removed from the stand and the empty hive set in its place, with a board slanting up from the ground to the entrance. Now the swarm may be hived just as though it still hung on the tree or limb where it clustered at first. By carefully lifting the box off the bottom-board, and carrying it to the new hive, most of the bees can be shaken out on to the alighting-board with a quick jerk, and they will run in just as though they had been shaken from a limb.

To return to my swarm taken out of the tree, I will simply say that it was divided that season, both colonies gathering sufficient honey to winter well. My next step after getting the bees home was to subscribe for GLEANINGS. It began coming in July, and has been coming regularly ever since.

TOOLS FOR BEE-KEEPERS.

An indispensable tool in the apiary is a good smoker. After using all of the different sizes of smokers made I recommend the larger sizes as being far superior to the smaller ones. A smoker of the 3½ or 4 inch size is the proper one to buy. They cost a trifle more than the smaller ones, but this extra cost is offset many times, for they burn longer and give off a more dense smoke; in fact, there is no argument that can be advanced in favor of the small smoker. A common mistake that most beginners make is to buy small or cheap tools and hives. I believe that the main reason why the eight-frame hive is more universally used than the ten-frame is becau e the first cost is less, and those who start with the eight-frame hesitate to make the change.

HOW MANY COLONIES TO START WITH.

The first things to decide upon are the number of colonies to buy, the size of hives, and the season of the year when the start should be made. When I began bee-keeping, many of the colonies around me were in hives of a size and style not to my liking; in fact, there was no standard frame in use then as there is now, and the beginner simply followed some one of the leading honey-producers, adopting his hive and frame. All these things are now changed, and the beginner will have no trouble in finding bees in hives containing regular Langstroth frames. This frame has more points in its favor than any other at the present time, and I would advise the beginner to adopt it.

There is a great diversity of opinion as to the proper number of frames to use in a hive. The majority use eight frames; but quite a number use ten frames to the hive, and a few think that

twelve frames are none too many for the best results. It is not the intention of this article to go into the discussion of the hive question; but if the beginner will take my advice he will adopt the ten-frame hive for the production of comb honey, but especially for extracted honey.

After deciding on the size of hive it is important to get the right number of colonies to start with. Beginners should understand from the first that there is much to learn, and that the first few years will be largely experimental, so that not much money will be made at first. The experience can be acquired about as well with a few colonies as with a large number, and the expense is much less. When starting on a small scale, the increase of bees and experience go together.

It is noticeable that those who have gone into the bee business on a large scale from the very first, without making an effort to get the necessary experience, have usually turned their attention to something else in a few years, usually going back to what they did before. This is the natural thing; for since they knew nothing about the producing of a paying crop of honey the venture proves a failure.

I would recommend at the start from two to four colonies, whether the beginner has much capital or not. I do not think that one without experience can go into this business and depend upon hired experienced help to do the work, for he must know the details himself before he can manage others in such a way as to make a financial success of his plans.

HOW TO BUY BEES.

In looking for colonies to buy it is well to select them from yards in the vicinity of the place where we expect to establish an apiary, if such can be found, for in this way no more bees are brought into the locality. This is a strictly business proposition, and the amount that one can afford to pay extra for colonies that are already within perhaps a mile of the proposed apiary is a little hard to tell The number of colonies a location will support, and the number already there, are determining factors. If the beginner has any doubts as to whether the location will warrant its bringing in new colonies, he should buy them near home, even if the price is twice what it would be at a more distant point.

During my early experience in bee-keeping there were a good many small apiaries around me, isolated from other yards, so that the bees had unlimited pasturage; and these few colonies in a place always gathered more surplus honey than those in the main yards where perhaps a hundred colonies were kept. The fewer bees in a given location, the larger the crop of honey, other things being equal.

WHEN TO START.

An experienced bee-keeper need not hesitate to buy bees any season of the year. Some of the best bargains are found in the fall, for it is then much easier to buy bees than in May, when the prospect of a honey crop is near at hand. However, for one without experience, May is the best month to purchase bees, for he will be sure of having them through one surplus season at least before he has the wintering problem to contend with, and this much experience will help him in the solving of the wintering problem.

NOT NECESSARY TO BUY OLD HIVES.

When buying bees, see that the combs are in good modern frames of Langstroth size. The hive is of secondary importance; for if the combs are of the worker size, and straight and true, they can be transferred to frames in new hives. This is the way most of our buying is done; for after the bees are transferred the old hives are returned, for we do not want them If the beginner were to buy three or four old hives, and use them in connection with new ones, they would never be satisfactory. It usually happens that bees can be bought enough cheaper without the hives to make it more economical all around to buy new hives outright.

In my next article I will tell how we select the bees, move them home, and I will also have something to say concerning supplies necessary to work with, etc.

Remus, Mich.

IRRIGATED DISTRICTS FOR BEE-KEEPERS.

BY J. A. GREEN.

[The following came from our old friend and correspondent, J. A. Green, who at the time of writing was in New York, about to engage passage for England. We hope to hear from him on his European tour.—ED.]

Wesley Foster's warning to those who expect a newly opened irrigated district to be valuable to bee-keepers at once was well put. He might have gone further and told how, in some cases, irrigated districts cease to be of value to bee-keepers in the course of time. This is the case in parts of Mesa County already. The land has become so valuable for fruit-growing that alfalfa is no longer raised, and sweet clover and similar plants are not allowed to occupy much ground. Land that is worth anywhere from $500 to $2500 per acre is too valuable to be allowed to produce much in the way of honey-yielding plants. Of course, the fruit-trees yield their nectar in season; but, though there are hundreds of acres of solid bloom, there are not bees enough at that season to get more than a small part of it, and later there is almost nothing for them to gather.

An irrigating project that has not been mentioned is the "High Line Canal" at Grand Junction, which the government has practically decided to build. This will open up a large tract of land to the irrigator, but most of it will be so quickly planted to fruit that there is not much encouragement for bee keepers in the project.

BEET AND CANE SUGAR.

W. K. Morrison, in speaking of the production of beet sugar some time ago, mentioned the beet-sugar factories of Colorado and adjoining States, and said that all the sugar they produced was uesd at home. I am away from home as I write this, and can not give the exact figures of Colorado's sugar production, but his statement is certainly far out of the way. I doubt if even one-fourth of the product of Colorado's sugar-factories is consumed within the State, or even the adjoining States.

A feature of this matter that has, perhaps, escaped his attention, and that is very interesting to me, is the large amount of cane sugar that is

used in the beet-sugar-producing districts. We have a large beet-sugar factory at Grand Junction, yet cane sugar is shipped here in large quantities. I have not been able to get exact figures; but averaging the estimates of the leading grocers indicates that at least fifteen carloads of cane sugar are shipped in annually, nearly all being retailed within half a mile of the beet-sugar factory. There are, perhaps, several reasons why this is so. Some people say they do not like the beet sugar; some say it does not keep fruit as well. Probably the majority of those who object to it do so because of the large amount of blueing in it, used to make it look white. Just why the sugar-manufacturers should be permitted to blue their sugar, apparently in plain violation of the pure-food laws, is a question I have not seen answered. Another reason that I think influences a great many is exasperation at the hoggish action of the sugar trust in compelling those who live within sight of the sugar-factory, and who, by their poorly paid labor at raising the beets, make the success of sugar production possible, to pay a higher price for sugar than the consumer a thousand miles away pays for the same article. On this account they will not use beet sugar at all, as a matter of principle. Unfortunately they are deluding themselves in this, as the amalgamation of the beet and cane sugar interests, only suspected before, is now an openly acknowledged fact, so that they must pay their tribute to the trust, whichever kind they use.

CLOTH COVERS FOR BROOD-CHAMBERS.

Doubtless the most satisfactory all-around cover to go next to the super or brood-chamber is a board held by the sides of the hive a bee-space above the frames or sections. In fact, nothing else ought to be used above the sections unless the tops of the sections are protected in some way. But in our dry climate, covers have such a habit of warping that it is difficult to find one that will close the top of the hive tight without the aid of the bees, who will seal such cracks with propolis if they are given the opportunity. But if this sealing at the top of the hive has been disturbed after the time when the bees can gather and work propolis, these cracks remain open. Besides, the cover that was tight in the fall may have warped so as to leave wide cracks in the spring, so that there is great loss of heat at a time when it is highly important that all the heat of the hive be preserved, so that brood-rearing will not be retarded by this loss of heat, and, consequently, of vitality. On account of this I prefer to use cloth covers during the winter and spring. "Quilts" some people call them; though why they should be given this name is more than I can tell. If these cloths are put over the hive at a time when propolis is not being deposited freely, the bees are apt to gnaw holes in them. In order to prevent this I prefer to give them a coating that will make them more satisfactory to the bees. The best way I have found to do this is to take a pound of beeswax, a pound of rosin, and half a pound of tallow, and melt them together. While still melted (not boiling hot) take the vessel containing it out of doors a safe distance from any fire, and, while stirring it vigorously, pour into it a gallon of gasoline. Lay your cloths on a board or sheet of tin, and paint them with this mixture, then hang them up to dry, which will take only a short time. Thin the mixture with more gasoline, if it needs it. Articles of clothing, tents, wagon-covers, etc., may be water-proofed in the same way very satisfactorily.

THEORY OF CELLAR VENTILATION.

Various Methods Scientifically Discussed.

BY E. S. MILLER.

[The following article treats of the science of ventilation in a masterly manner. Every one who winters indoors, or who expects to build a bee-cellar next fall, should read this carefully. It is not difficult to understand; and if the principles here set forth are mastered, hundreds of colonies will be saved.—ED.]

The problem of cellar ventilation is to the bee-keeper an important one; but, judging by the construction of most bee-cellars, the principles are apparently not well understood. In considering this question the following facts should be kept in mind:

1. That warm air, volume for volume, is lighter than cold air, and will rise to the top of the cellar.

2. That moist air is lighter than dry air, and will rise.

3. That, while the moisture is more apparent at the bottom, owing to condensation, there is really more water vapor at the top because of higher temperature, and the consequently greater capacity of the air for moisture.

4. If cold air is admitted at the top it will pass downward, cooling and condensing the moisture, especially that within the hives, while the warm air escapes.

5. If there is a considerable number of colonies in the cellar, the temperature within will always be several degrees higher than that of the earth, no matter what may be the temperature outside; hence the air within will tend to move upward and out. It follows that, in order to ventilate a cellar properly, it must, with the exception of ventilating-flues, be practically air-tight.

It is generally conceded that, in order to insure the best results, the cellar must not only be kept reasonably dry, but also that there should be maintained a nearly constant temperature with a minimum of about 45° F., and a maximum of about 50°. A temperature below 45° will tend to condense moisture; while if much above 50°, the bees will be likely to become restless. Furthermore, there should be some means of removing any noxious gases or foul odors, and of constantly supplying pure air at the proper temperature.

In general there are two ways of securing the above conditions; first, by taking advantage of the differences between the nearly constant temperature of the earth and that of the air within and without the cellar; and, secondly, by the use of artificial means—for example, the burning of fuel in stoves or furnaces.

Let us suppose a cellar extending eight feet under ground, frost-proof at the top, and, with the exception of flues, made practically air-tight by being plastered within, and with door and windows tight. Let us suppose, also, there are two or more underground pipes of six or eight inch tile extending 25 feet or more at a depth of five to eight feet. With the cellar upon or near a

hillside, the problem is comparatively simple; for let A, B, C, D, Fig. 1, represent a vertical section of the cellar, and M A the surface of the ground. Then in cold weather, the outdoor air entering the pipe P will be warmed; and, being

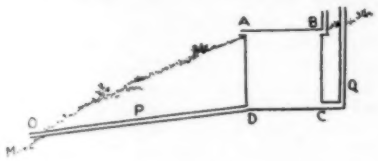


FIG. 1.

lighter than that outside, will rise, enter at D; and, if the current is not too strong, it will diffuse throughout the cellar before passing out at C. The strength of the current can be regulated by varying the size of the opening O. The opening B should, of course, be kept closed in cold weather. When the air outside becomes warmer than the earth, the air entering the pipes P and Q is cooled; but, since the cellar is warmer than the ground, due to heat generated by the bees, the air will pass in at C and D, and upward and out at B which should now be left open to carry off off heat and moisture.

With a cellar on level ground the problem becomes more difficult. The air will not circulate properly except as forced through by wind pressure or by some artificial means. Again, let A, B, C, D, Fig. 2, represent a vertical section of

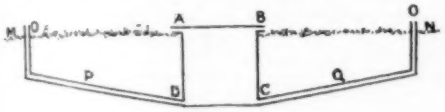


FIG. 2.

the cellar. Let P and Q represent the underground pipes, and A and B openings at the top. Let the wind pressure be in the direction AB. Suppose A and B are open, and C and D closed. The cold air entering at A, being heavier, will fall to the bottom, displacing warm air, which will pass out at B. The cooling will also tend to condense any moisture within the hives, bringing about a condition not at all desirable.

Suppose, next, that the air outside is warmer than that within. The warm air will then move directly across from A to B, removing some of the moisture, but not greatly changing the temperature of the cellar.

Next, suppose A and C open and B and D closed, and the weather cold. The current will be downward, condensing the moisture and chilling the bees. If warm outside, the temperature inside will be raised. Suppose, again, A and C closed, and B and D open; the air from D will rise and carry off both heat and moisture, and the tendency will be toward a strong current in cold weather.

Again, let A and B be closed and C and D open. In cold weather the air entering at D, if not permitted to pass too rapidly, will become diffused and pass out at C, not greatly lowering the temperature, but removing moisture. This is an ideal arrangement provided the strength of the air current can be properly regulated; but wind pressure is a varying quantity, and experiment shows that the current through the underground tile is quite strong when the wind is blowing. Lastly, suppose the temperature outside higher than that of the earth, and ventilators C and D open and A and B closed. The air within, warmed by the activity of the bees, will have no chance to escape, nor will the water vapor, since both rise to the top. The air entering at D will pass directly across to C.

To summarize, we may say that, during cold weather, only bottom ventilators should be open; but when the weather becomes warm, both bottom and top should be opened to allow the cool air to enter at the bottom, and the warm moist air to escape at the top.

We will now consider briefly some of the artificial means of ventilation. There are several ways in which a current of air may be produced,

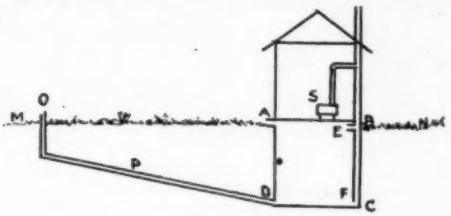


FIG. 3.

most of which are not practicable for the beekeeper. The most common mode is to extend a chimney or pipe downward from a room above, as shown in Fig. 3. S is a stove; C the chimney open at F. With A open and D closed, as is quite common, the arrangement is worse than useless in cold weather, nor is it desirable at any time. With A closed and D open, moisture may be removed without cooling the cellar appreciably. In warm weather E and D should be open and A and F closed.

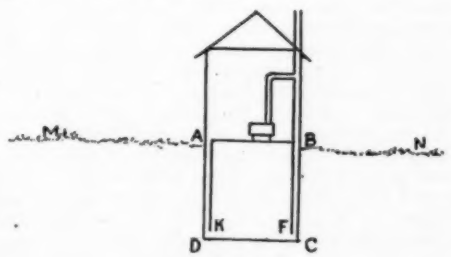


FIG. 4.

In Fig. 4 warm air passed down AD enters at K and finds its exit by way of the chimney at F. This is a very good way of ventilating provided the air in the room above is of the proper temperature; and, secondly, that the current is sufficient to accomplish the desired results. It will be found by experiment that very little air will pass down AD unless the cellar is tight and all outside openings closed. If the air in the room above is cold, all openings through the floor should be kept closed, as cold air will run in at the top like water into a cistern.

The tile for bottom ventilators should be at least six inches in diameter, and the outside en-

trance should be provided with some means of varying the size of the opening. The opening ought to be considerably smaller than the tile. This will cause the current to pass more slowly, the tile acting as a chamber in which the temperature of the air is modified before entering the cellar. The pipes should extend several rods under ground on both sides, and should be placed well below the frost-line.

It is well known that, in the construction of many bee-cellars, the foregoing facts and principles have not been considered, and yet the bees have often passed through winter in a fairly good condition. This, I believe, is in spite of improper ventilation and not because of it. The fact that they do not always winter in prime condition is sufficient to warrant us in giving the subject of cellar construction and ventilation a more thorough and scientific study; for under proper conditions, and with sufficient stores, the successful wintering of every colony is practically a certainty. Another advantage to be noted is that, if the bees have a supply of pure but cool air, they may be kept quiet in the cellar considerably later in the spring, thus avoiding much of the loss due to bad weather.

Valparaiso, Ind.

ALSIKE CLOVER IN GOOD CONDITION IN CANADA.

Winter-killing a Misnomer.

BY J. L. BYER.

Drouth in the fall is not injurious to the clover, as this plant will stand a longer period of dry weather, without being injured, than almost any other kind of vegetation that I am familiar with. By this statement I mean, of course, plants that are native to our latitude and which thrive in it. During the past fall and late summer one of the most prolonged drouths in the history of our country visited this section; but for all that, the many acres of alsike around us never went into winter in better condition. If the alsike sown in the spring happens to be a poor "catch," and the season unfavorable for the plants to develop well, before the grain which has been used as cover crop is cut I have known the young plants to be killed, especially if a very hot dry spell had occurred immediately after the grain had been cut. If on the other hand, as was the case this year, the "catch" is good, and the weather favorable for the plants to develop their root growth, any amount of drouth in the fall will not affect the plants.

As to the term "winter-killing," as applied to clover in the great majority of cases, it is a misnomer—at least so far as our experience goes in the matter; and I might say that, previous to the last five years, for twenty-five consecutive seasons the writer was on a farm where the raising of clover for its seed was one of the main crops. In all that time I can recall only one year when the clover was killed in the *winter*. That season, during the last week in January, a warm spell of weather melted away all the snow; heavy rains followed, and then it suddenly turned very cold, the thermometer standing at from 10 to 20 below zero for about three weeks in succession; in fact, it was the longest cold spell on record for our part of the country. Whether it was on account of so much ice on top of the ground, or of the intense cold on the unprotected plants, I can not say; but it is a fact that *that* year the clover was "winter-killed." However, more than once we have had goods fields of clover ruined during the months of March and April. During the latter part of March and early part of April, we often (in fact, generally) get days in which the sun shines brightly, and thaws out the soil to the depth of three or four inches; then at night it freezes hard, and the result is that the clover is, by this continuous thawing and freezing, literally "heaved" out of the ground. I have seen fields of clover, particularly the common red variety, in which nearly every plant was right out of the ground, and this notwithstanding the fact the roots of the plants were quite long; by actual measurement some of them were ten inches in length Of course, this length of root is an exception, and it is given only to show what really unfavorable *spring* weather will do to clover. As hinted at already, the alsike as well as the white clover is not as liable to injury as the red variety; but if the kind of weather conditions as described last long enough it will hurt them too. Some soils are more apt to heave than are others. Underdraining helps to remedy the evil, no matter what the nature of the soil.

While what I have said has been more in connection with the raising of alsike, we also cultivated the common white or white Dutch, as it is called by the seedsmen, for a number of years, and so far as its wintering qualities are concerned, there is very little difference between it and the alsike. If any one takes the trouble to look at an old pasture-field, in which white clover was quite plentiful the previous summer, he will find, after a spell of this alternate freezing and thawing, that many of the plants will be standing on their toes, showing that, as with the alsike and red varieties, it is the spring and not the winter that does the damage.

50° TOO HIGH A TEMPERATURE FOR A BEE-CELLAR.

The winter here has been quite moderate so far, and I believe that the bees are wintering all right. All of my bees are outdoors except 40 at one yard that are in a cellar. The thermometer in the cellar has never been higher than 48 nor lower than 42, and the bees are much quieter at the lower figure than at the other. There is a furnace in the cellar, but the bees are separated from the furnace-room by a partition of one-inch boards. The windows are open a good part of the time in the other parts of the cellar, so that, while the room where the bees are is quite dark, yet there is plenty of fresh air at all times available for them. I can not understand how some can keep the bees quiet at the high temperatures often mentioned. Certainly the bees in this cellar simply roar when it goes up to over 50, as was the case last winter a few times.

Mount Joy, Ont.

[See editorial on the subject of drouth and winter killing clovers, elsewhere in this issue.—ED.]

THE BAYLESS UNCAPPING-MACHINE.

A Device for Cutting Cappings from Both Sides of a Comb at One Operation.

BY R. F. HOLTERMANN.

For many years bee-keepers engaged in the production of extracted honey have desired something more suitable for uncapping the combs than the present honey-knife. For my own part I have done very little uncapping, as I have always felt that my services were more needed in the apiary. There is much difference in the degree of success that different operators have in uncapping combs with the ordinary knife. Some readily become experts, while others never do.

Various uncapping-machines have been suggested—two rollers, for instance, with projecting pins to remove the cappings as they revolve at high speed. I understand that a machine of this nature has already been used, but it does not appear to have made much headway.

An uncapping-machine that would meet the requirements of practical bee-keeping has been my desire for some years; but after a good deal of deliberation I had almost concluded to give the subject no more thought, for the task seemed almost hopeless. However, so far as I can judge, the Bayless uncapping-machine is likely to meet the requirements of the apiarist, and others who have seen the machine work share this opinion with me.

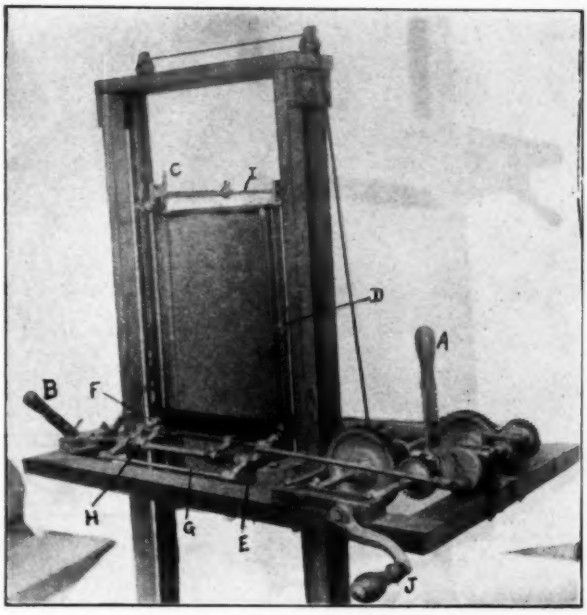


FIG. 2.—BAYLESS' UNCAPPING-MACHINE.

In this model, the comb, beginning at the upper end-bar, is uncapped down to the lower end-bar as the frame is pulled up.

Mr. Wm. Bayless, of Brantford, Ontario, Canada, has a mechanical turn of mind, his experience as a bee-keeper and his employment with a firm which for years made bee-keepers' supplies, giving him an excellent opportunity for designing an article of this kind. His machine, which is herewith illustrated, works well; and from the simplicity of its construction I judge that the price will bring it within the range of even comparatively small bee-keepers. It may be very rapidly operated by hand, or a device for power can be attached. Both sides of the combs are uncapped simultaneously; the machine may

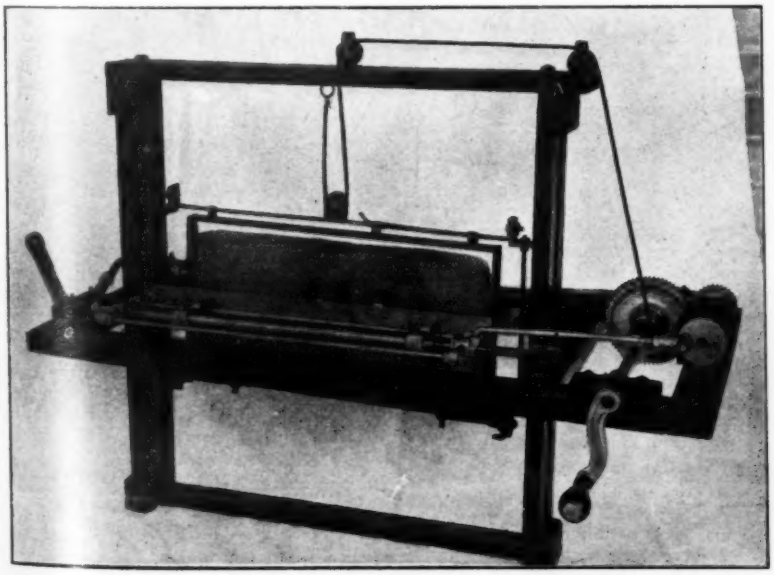
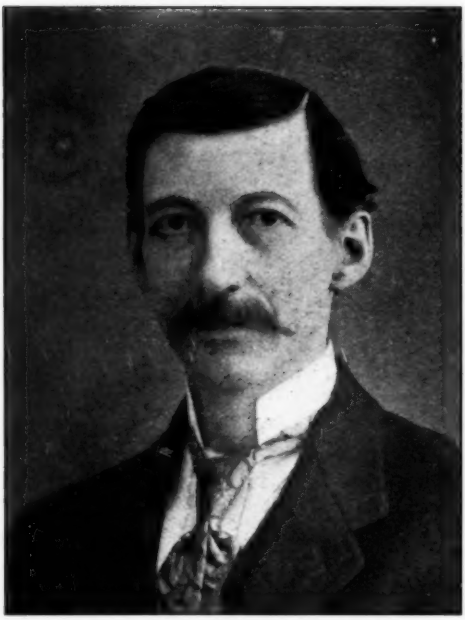


FIG. 1.—BAYLESS' UNCAPPING-MACHINE.

In this model, the comb, beginning at the bottom-bar, is uncapped down to the top-bar by the sliding knife, as the frame is pulled upward.



WM. BAYLESS, BRANTFORD, ONT., CAN.

be built to hold the comb as in Fig. 1, with the top-bar down; or as in Fig. 2, with the end-bar down.

The lateral movement of the knives can be confined to the space inside the frames, so that if the end-bars in Fig. 1, or the top or bottom bars in Fig. 2, should project beyond the combs they need not interfere with the knives in the least. In Fig. 1 the knives are arranged to uncap down to the top-bar, but no further, so that a staple or other spacing-device may be attached to the side of the top-bar if desired. The knives when running inside the frame can be set to cut the comb down to any desired thickness; in fact, the comb could be cut down to mere foundation if necessary.

With the present tendency on the part of bee-keepers to produce more wax, and on account of the view that is now pretty generally accepted, that it takes less honey to produce a pound of wax than at one time supposed, there is, in my estimation, considerable ground for uncapping deep. The honey can be strained from the cappings, and the latter rendered into wax by the usual method. A uniform cut across the combs makes straight regular combs — a desirable attainment under all conditions. The question may fairly be asked, "How will the machine work in case the comb is of uneven thickness?" To answer this I will state that, in any system of uncapping, only combs with a uniform base, such as that secured by comb foundation, should be used. Furthermore, if the combs bulge in certain places such projections should be removed any way, in order to make the comb more uniform for the next extracting. When there are depressions, the depth to which the knives cut can be quickly adjusted by means of a lever. By this I mean that, while the machine is in motion, the depth of the cut can be adjusted to fit the case. If the operator does not care to cut deeper, or if there should be a spot where the comb is so shallow that the knife does not touch the surface, as might be the case with exceptionally uneven combs, the remaining cappings could be removed by means of a knife in the ordinary way.

In Fig. 2, A is the handle of the clutch that allows the comb held in the metal frame to pass to the bottom of the machine when it is ready to be uncapped. The uncapping is done while the comb is pulled upward, for in this way the cappings fall away from the knives by their own weight as they are cut off. B is the hand lever which throws the knives in position, and regulates the depth to which they cut. C holds the top-bar, now at the left side of the comb. It may be very quickly adjusted to suit any variation in the size. D holds the bottom-bar firmly in place. E is a device that allows the knife to be adjusted to cut any depth, still retaining the proper angle. G and H are the parts that hold the knife, and that give to it the lateral motion as it cuts.

A frame may be put into the machine, both sides uncapped, and removed again in half a minute. My preference is for the machine shown in Fig. 1; but this is, perhaps, because I do not use a wide end-bar, but have a staple for spacing in the side of the top-bar.

Brantford, Ont., Can.

[This machine is identical in principle with the one brought out by Mr. Arthur C. Miller, of Providence, R. I., in 1902. Indeed, a patent was granted to him Oct. 14 of that year, covering every feature of the Bayless machine. Of course, the American patent would not interfere with the use of this machine in Canada unless Mr. Miller had the same thing patented there.

Some six or eight years ago Mr. Miller sent us one of his machines, that embodied the general principles shown in the Bayless. As we were not then in position to give it a thorough test we sent it to Mr. R. C. Aikin, of Loveland, Col., with the request that he not only try it but that he get others to do so if it proved to be a success in his hands.

Some time afterward he reported that he had tested the machine, but that he could work more rapidly and more satisfactorily by the ordinary hand uncapping method. Mr. Miller himself, we believe, gave the principle a test—how extended we do not know; but the fact that he afterward applied for a patent on an entirely different principle for uncapping combs would seem to indicate that his original machine, in his judgment, was not a success; for on June 23, 1903, another patent was granted to him covering the use of a series of spring-actuated knives, each independent of the other, and having its cutting edge at an angle to the plane in which the knife moves. We are not informed as to the ultimate fate of this machine. We tested it in a small way, but did not arrive at any satisfactory results.

Whether Mr. Bayless is able to do more and better work with his machine than the average man can accomplish with the uncapping-knife, we can not say. It is possible that the original or first Miller was prematurely abandoned, or it is

SCHILLING'S BEE-SHED ROOFED WITH SEPARATE PIECES OF GALVANIZED IRON.

possible that Mr. Bayless has made some slight improvement by which he overcomes the defects of the Miller machine. But the action of the Bayless knives, and the angle of them toward the combs, are precisely the same as those in the Miller machine. While the Providence man used a cam movement, Mr. Bayless employs the principle of the crank. We should be glad to get reports from those who have tested the Bayless machine.

In this connection we may mention that Mr. Samuel Simmins, of Sussex, England, has invented an entirely different machine from any thing that has yet been mentioned. It consists of a series of *stationary* sharp-edged knives or V-shaped trowels mounted vertically, and so spaced that the cutting edge of one knife would extend beyond that of the other. If the Miller patent of 1903 had not been limited to the use of knives actuated by springs it is clear to us that his patent would have covered the Simmins invention also.

Our English inventor claims that his device is an unqualified success. Indeed, he feels absolutely sure that it will supersede nearly all hand uncapping for frames without projections or spacers. It is cheap in construction, and could probably be put on the market, if it fits American conditions, at a comparatively moderate price.

In the mean time there is another uncapping-machine in Chicago, concerning which some claims have been made. For the present, at least, the public will doubtless be conservative, believing that, inasmuch as machine uncapping has proved a failure in the past, it will continue to do so. We shall see.—ED.]

A BEE-SHED WITH AN ADJUSTABLE ROOF.

BY G. F. SCHILLING.

The hives shown in the shed face the south except a long row to the left which faces the east. These sheds are convenient in many ways. The roof is of 1¼-inch corrugated galvanized iron sheets, 26 in. wide by 4 feet long, and each piece is movable so that it may be raised to any desired height. After the fourth super is put on it raises the iron beyond the framework so that the one piece must be held down by a stone. There is a wire running parallel with the front of the sheds, just high enough to let the roofing-sheets slip under when there are not too many supers on. It is supported by two cleats of wood nailed to the outside ends of shed and drawn tight by an eye-bolt with long threads. Bricks placed on the rear ends of the sheets usually hold them down without another wire. Some of the best colonies are in the sheds facing the east, not in the view, one colony filling seven complete supers and another six. Also two others side by side with six each, one of them a new swarm, hived in June.

The old colonies are usually wintered in the sheds, and are packed with plenty of newspapers around and over them, between the oilcloth and covers, and straw or hay between and over the hives. The entrance is closed to one or two inches. They usually winter very well this way, and come out in the spring strong and healthy. The new swarms and lighter colonies are usually taken in the cellar for the winter.

State Center, Iowa.

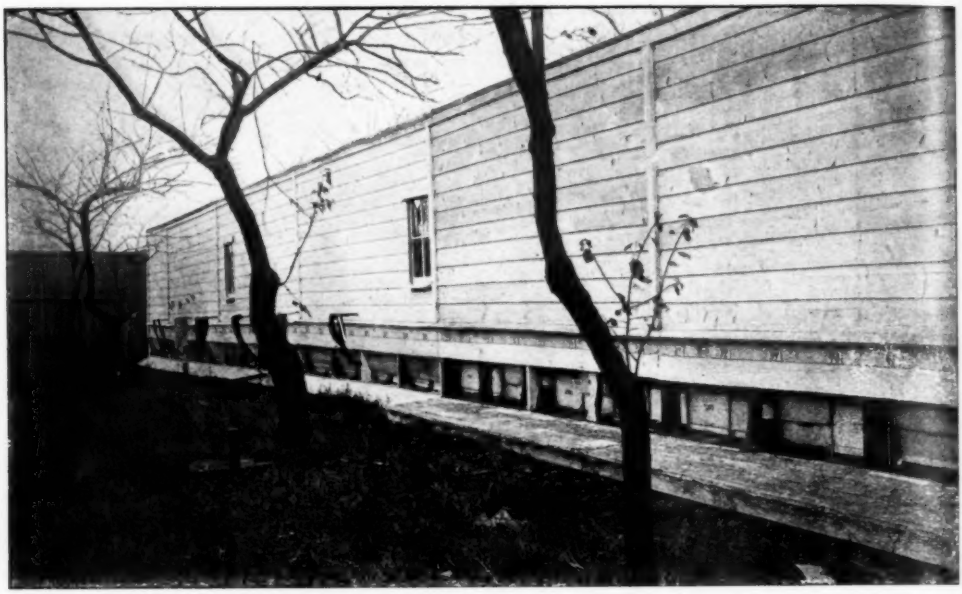


FIG. 1.—W. C. SORTER'S HOUSE-APIARY.
The different-colored rags are used to enable the bees to mark their own entrances more easily.

HOUSE-APIARIES.

Some of the Advantages of Keeping Colonies in Permanent Sheds.

BY H. H. ROOT.

The house-apiary has been in use almost as long as any thing else in connection with bee-keeping. In portions of Europe especially, it is seen on every hand. The subject is one that has been discussed pro and con in the bee-journals for years; and lest some might feel that we were reviving an old threadbare topic it might be well to explain that the purpose of this article is not to urge the use of the house-apiary on bee-keepers in general, but simply to show how it is being used in some instances to-day, and to mention briefly a few of the advantages. Many who formerly used house-apiaries do not use them now; but, on the other hand, there are some who never thought of even trying them who are suc-

FIG. 2.—OUTDOOR COLONIES SHELTERED ON THE NORTH BY THE HOUSE-APIARY AND ON THE WEST BY A HIGH BOARD FENCE.

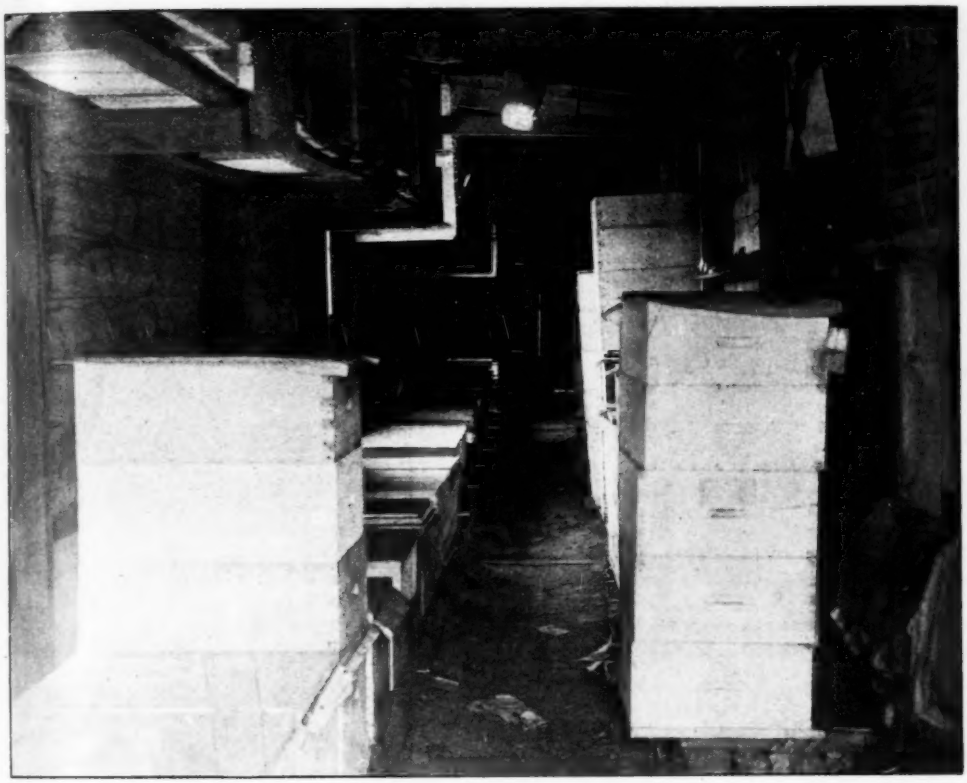


FIG. 3.—INTERIOR OF SORTER'S HOUSE-APIARY.

The colonies are arranged along the south wall on the left. The rest of the building is used for empty supers, supplies, etc.

ceeding with them. Although the general opinion is that house-apiaries cost more in the long run than the plan of keeping the hives on separate stands, and that they are less convenient, still we believe that there is a place for them in modern bee-keeping, as the history of the industry has shown.

A great many who have not studied the subject deeply are carried away, so to speak, by the thought of putting up a cheap building to shelter the hives, thinking that by so doing the hives may be constructed of thin cheap material, and that the colonies can be easily protected in the winter with but little expense. There are many things to take into consideration, however, as the following letter shows:

I have a house-apiary 12 ft. square. It is provided with a double floor with paper between the boards. The walls are covered on the outside with patent clapboards, and are sheathed up on the inside, the space between being filled with fine hay chaff. I have wintered colonies in this building for three years, and I find that they consume about the same amount of stores as those wintered outside in the yard. They do about as well, so far as making surplus honey is concerned, as those outside.

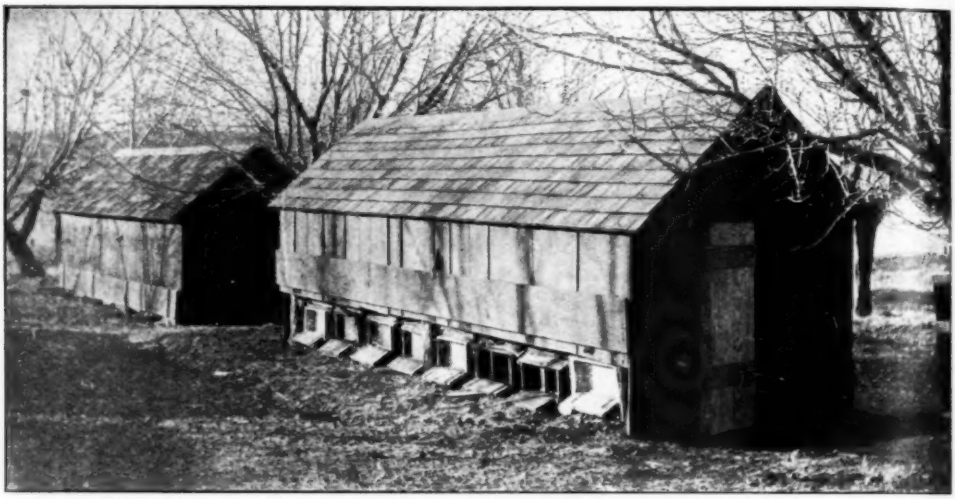
During the three years that I have had bees in this building I have lost forty-three queens as against only two lost from the same number of colonies in the yard. I would not advise any one to build a house-apiary, for a good one costs about one hundred dollars, and the colonies do no better than those outside on separate stands.

MINOTT C. YOUNG.

Rutland, Vt.

The above letter shows pretty conclusively one of the greatest disadvantages of the house-apiary; that is, the fact that many young queens are lost by getting into the wrong entrances when returning from the mating-flights. However, this loss can be overcome to a considerable extent by painting around the entrances with different colors, or by changing the appearance in some way so that the bees may more easily mark their own entrances.

Mr. W. C. Sorter, of Wickliffe, Ohio, felt that he was obliged to erect some sort of shelter for his apiary; and since he needed a building also, for supplies, storage room, etc., he decided to construct one that could be used for the bees as well. He therefore put up a building about 30 ft. long, facing the south, the wall on the south side near the ground being left open to accommodate a row of hives. The other side of the building was used for a storage-room; and the wall on that side, instead of being solid, was made so that it could be opened up on hot days in the summer in order to prevent too high a temperature. To provide the proper amount of opening, the ventilators at the back were constructed 18 inches wide by 14 ft. long. After a trial of this building Mr. Sorter was so well pleased with it that he extended it to a length of 60 ft. The illustrations show the front (south) side of this house-apiary. As the building now stands, there are three 14-ft. ventilators on the back (north) side, which, with the windows, give all



TWO OF IRVING LONG'S BEE-SHEDS

It will be noted that a windbreak can be let down over the fronts of the hives when necessary.

the light necessary for manipulating the hives, etc. Fig. 3 shows the inside of the building with the ventilators closed. The row of hives at the left are those that contain the bees, and those on the right (north) side are empty supers which stand in front of the ventilators, so that these can not be seen.

In the spring, especially on cold days, the sun shining on the low roof warms the building so that it is often 20 degrees warmer than the outside. During the cold weather of winter, however, there is a difference of only 3 or 4 degrees between the temperature inside the building and that outside. In very hot weather in the summer, as mentioned before, the ventilators are swung open so that the inside of the building is really cooler than the air outside.

Since the building faces the south the sun shines into the hive-entrances in the winter. But as the sun shines more perpendicularly in the summer the hives are entirely in the shade. Mr. Sorter says he has not found that the bees fly out while the sun is shining in the winter without being able to get back, for he has seen them fly out in the sunshine, even at a temperature of 32 degrees, and still be able to get back to the hives. At other times, however, when the sun was not shining, in damp cloudy weather, he has noticed that the bees seem unable to get back, even when the temperature is close to 60 degrees; for at such times they collect in protected places on buildings, etc., and finally die. On account of these observations he thinks that there is less loss from bees being unable to get back into the hives on sunshiny days than on damp cloudy days, even though the temperature is warmer. The sunshine seems to give them life.

The front of the building, as can be seen from the illustrations, is constructed in such a way that weather-boards may be placed over the fronts of the hives, thus sheltering them from the cold winds in the winter. These weather-boards may be seen at the further end of the building, already in position, arranged so that they will just fit in between the 2×4 studding of the wall, leaving only enough room at the bottom for the entrance.

The water-table prevents the water from dripping down and possibly freezing in the entrances. This feature, in connection with the boards before mentioned, protects the entrances admirably.

Mr. Sorter formerly put packing material around the hives inside the building, but has lately found this unnecessary, as the building itself is enough of a protection during the winter. In the summer the building also acts as a protection from the heat; for when the ventilators are opened the temperature inside is such that the bees rarely cluster out on the fronts of the hives.

In order to overcome the mixing-up of the bees, and also the loss of queens, various colored cloths were hung on the front of the building with the idea of permitting the bees to mark their entrances more easily. It has been found that the plan worked well, for there has been very little loss in this respect.

Mr. Sorter sees quite a number of advantages in such a building. For instance, since some kind of building is a necessity any way, it costs but little more to build it long and narrow to accommodate a row of hives. Then when this is done, the supplies, extra supers, etc., can be arranged close to the hives where they are wanted. It is not necessary to stop working with the bees in case a rain comes up. Furthermore, during robbing time the work can go right on with no trouble whatever. The bees fly inside the building so little that visitors can be shown every manipulation without wearing veils.

Mr. Sorter has found that he gets about the same results in surplus honey from the colonies inside the house-apiary as from those outside, other things being equal. About the same number of colonies are kept outside on separate stands, so that an excellent opportunity is provided for studying the two plans side by side. The principal point to be careful about is to pre-

vent the mixing-up of the bees and queens, and to arrange the inside so that plenty of light, ventilation, etc., may be provided when necessary. One of the greatest advantages of the whole plan is that single-walled hives may be used with cheaper covers, bottom-boards, etc., since all these expensive parts are not exposed to the weather. Furthermore, hives, supers, etc., do not need to be painted, necessarily, with the exception of the fronts. The building itself deteriorates, as any building will; but if kept painted it should last almost a lifetime.

There is another distinct advantage in favor of the house-apiary; and that is, that cross bees are much more easily handled when housed in a building than when outdoors. If they fly out inside they never offer attack.

The article by Irving Long, that follows, shows that colonies in house-apiaries do not swarm as much as those outside on separate stands.

HOUSE-APIARIES.

Swarming Largely Prevented by Keeping Hives in Permanent Sheds.

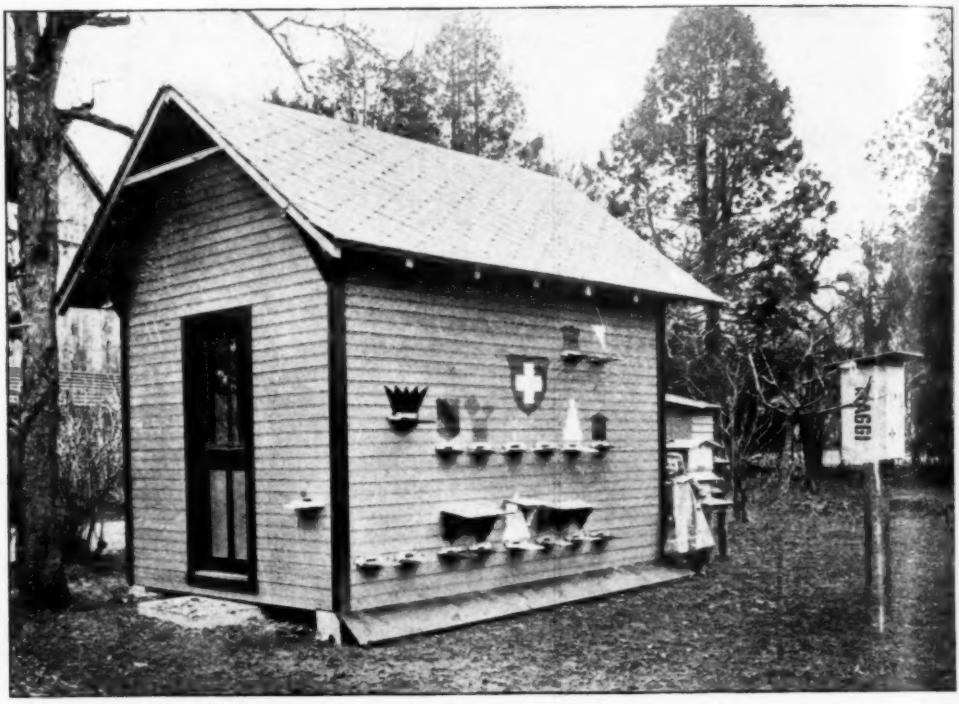
BY IRVING LONG.

For some years I have had five house-apiaries from which I take from one to three tons of honey a year, which is all that I can sell here around home. These houses or sheds are 16 ft. long, 6 ft. wide, and 4 ft. high at the eaves, the height in the middle, of course, being sufficient for a man to stand easily. Each shed holds only eight colonies, for I have found that this number gives the best results in wintering. In the spring one colony at each end is moved out a little at a time and set on a separate stand under a tree, for with eight colonies in the shed during summer the hives must stand so close that many queens are lost. Even with only six colonies in each shed I paint the hive fronts different colors, no two colors being side by side. I have found that whenever there *is* any mixing it is always between hives painted the same color. All the hives in the sheds stand on 2×4's so that it is very easy to space them a little wider when the two hives have been removed.

The illustration shows two of my houses, the one in the background having the storm-door swung down over the fronts of the hives, the way I leave it the most of the winter. The storm-door, however, may be raised whenever it is desirable to allow the bees to have a cleansing flight, and during the summer it is, of course, left up.

In very hot weather in summer the hives are raised ½ inch from the bottom-boards in front; and if this is not sufficient I sometimes pry the super covers back to give ventilation at the top until all clustering on the outside of the hives is

INTERIOR VIEW OF IRVING LONG'S BEE-SHED.



With another communication, DR. BRUNNICH sent us the above photograph of this bee-house at his residence, Arzt, Ottenbach, canton Zurich, Switzerland. Notice the painted designs, etc., to enable the bees to mark their own entrances more easily.

prevented. Very few colonies swarm when I follow this plan, while every colony outdoors swarmed this year, even though they were provided with empty combs. If my colonies outside stood in the sun I should not expect to get an average of 75 pounds to the colony; but I average twice that amount from the colonies inside the sheds, and several of the hives gave me 300 lbs. each.

The other illustration shows the interior of one of the sheds. I can not begin to tell how much nicer it is to work with the bees inside these buildings. It is true that it is harder to find queens, but still I almost always locate them without much trouble.

During the winter a feeding-board of my own make is put over each colony, and over this a gunny sack is spread. The telescope caps are filled solid with leaves or straw. I have not lost a colony in the winter during the last twenty years; but I aim to leave from 40 to 60 pounds of honey for each one; and if there is not this much in the hives I feed until there is.

I use queen-excluders, and take all the honey off, when finished, with bee-escapes.

I began keeping bees in these bee-houses or house-apiaries thirty years ago, and have tried all kinds of buildings; but the ones shown suit me better than any of the others.

Marceline, Mo.

[The storm-door arrangement shown, p. 170, is excellent providing it does not prevent the flight of bees during winter. It should, in our judgment, be let down early in the fall in order that the bees may get used to it.

You are exactly right in saying that it is much nicer to work with bees inside. We suppose you mean by this they are much quieter to handle, for they never offer attack on the operator in the building, and the troubles incident to robbers stealing loads while the hives are open are entirely overcome.—ED.]

HOUSE-APIARIES EXTENSIVELY USED IN GERMANY.

The Problem of Wintering Close to the Alps.

BY J. A. HEBERLY.

I have traveled hundreds of miles and seen hundreds of house-apiaries in Southern Germany, but did not see a single apiary where the hives were set out in the open air, as I see in pictures of almost every number of GLEANINGS. I have reasons to believe that, in Northern Germany, the house-apiary is also the rule. Losses in winter by the experienced bee-keeper, unless through neglect, are rare—perhaps through the loss of a queen or two. The man who just owns or holds bees has numerous losses—yes, often in one or two unfavorable seasons he may lose the last one. I think the losses due directly to the cold are very rare; bees can stand much cold; but if the stores are not in the proper place it happens frequently that the bees have used all the stores in

reach, and, owing to the cold weather, can not get to the food that may be at the further end of the hive. Prolonged cold weather has caused losses indirectly, though in this case the bees were really starved.

The difficult task in this vicinity is not the wintering, but to have strong colonies by the beginning of the main honey-flow, which begins in this neighborhood with the dandelion, May 12 to 15, and lasts about two weeks. By July 5 the honey-flow is over so far as surplus is concerned, and we are content if the colonies gather from that date what they need for maintenance and the next winter. What makes the task difficult is that we are about 2500 ft. above sea-level, and quite close to the Alps; consequently we have, late in the spring, very inclement weather; cold rains, and even snowfalls at the time when the dandelion is in bloom, are not uncommon. I do not desire extra-populous colonies, as the surplus from such strong colonies falls very often short of expectation. Medium colonies with a good proportion of field-workers are what I prefer. Between the middle of May and 1st of June I often reduce the number of frames allowed the queen for brood-rearing. This would probably be quite wrong in your country; but with me it has been satisfactory. The intelligent bee-keeper must adapt his practice to the flora of his locality—to the sources of nectar in reach of his bees.

Stoetten, Bavaria, Jan. 13.

QUEEN-EXCLUDERS.

Wire vs. Zinc; What Can be Expected of Wire Excluders?

BY E. D. TOWNSEND.

For the last few years, in a part of our yards we have been using zinc excluders to quite an extent in the production of extracted honey, and we would use them on all of our extracted-honey colonies were it not for the fact that a season of excessive swarming comes about one year in three, so that at our outyards, where no one is present to hive the swarms, there is considerable loss, even when as large a hive as a ten-frame Langstroth is used for a brood-nest. The loss merely of the swarms is not the total loss by any means, for bees when preparing to swarm do not work with the same vigor as do those colonies that do not acquire the swarming fever during the honey-flow, but keep on piling in the stores. These years of excessive swarming have caused us to work out a system of manipulating our upper stories so as to get along without excluders, and still have but little brood in the upper story at extracting time. This system, however, has been described in previous issues so it will not be necessary to go over the same ground again.

We do not think there is much difference in the amount of honey stored, whether an excluder is used or not, with the exception, as I mentioned before, of the years when there is excessive swarming. It is true that there will be a little more honey in the upper stories where no excluder is used; but, on the other hand, there will be more honey in the brood-nest when the excluder is used. This extra amount of honey in the brood-nest is the principal cause of the swarming fever, because the queen is crowded. This is especially true if the bees are three-banded. Hybrids carry their stores above more freely than the pure Italians.

The zinc queen-excluder really amounts to a horizontal division-board; and, although the workers may move back and forth from one story to the other at will, still there is a division between the two parts. As every one knows, when a queen-excluder separates two stories the bees will build queen-cells and develop a laying queen in the upper story if there is brood present and a fly-hole provided so the young queen can take her mating flight; and if the bees are let alone, two normal colonies will be the result, both of which use the one common entrance.

This proves to me that the bees regard an excluder as the top of the hive; but when they get their hive full of honey and brood they will crowd above and store honey in the upper part, just as they would store honey in combs hung in a portico; and as long as the honey keeps coming in they might store nearly as much in a portico in front as in the story above. The fact that more honey is stored in the brood nest under an excluder convinces me that, if we put enough obstructions between the brood nest and the surplus receptacle, swarming will be the result in every instance. At any rate, about every third year, as I said before, we have as many as twenty per cent of the colonies swarm where excluders of the zinc type are used, even though there are plenty of drawn combs above.

The new wood wire excluder has a little more opening than the zinc, but it is a question in my mind whether there are enough more openings to make any difference in the amount of honey stored above or in the number of swarms that issue.

As I mentioned at the first, it seems to me that we do not realize the full value of a wire excluder in the drone-trap entrance-guard, or even in the wood-wire excluder. I think we should use an *all-wire* excluder. With such a honey-board we should expect to find no congestion of the brood-nest caused by the reluctance of the bees in working through the excluder, for it looks to me as though there would be so very little obstruction that the results would be the same as if there were no excluder at all between the hive and upper story. A woven-wire construction, so to speak, the bees would not notice, and it would be so open that they would cluster over it as if there were nothing there, and there would be no cells built above it either, even though there were young brood in the upper story. To my mind this would indicate that the colony was in a normal condition as a whole; in other words, that it would be the same as though no excluder were used. Under these conditions I think there would be no more swarming with the wire-excluder than without if the proper size of brood-nest were used.

Remus, Michigan.

[The wire excluder not only gives more opening, but, what is of still greater importance, it has no sharp burr-edges like a punched metal. It is these sharp edges in the old excluders that obstruct the bees to some extent.—ED.]

SEALED COVERS VS. ABSORBENTS.

A Strong Plea for Absorbents.

BY W. L. COGGSHALL.

Mr. Root:—I promised you I would give you a scrap on sealed covers. First, a sealed cover holds all the breath or moisture the bees give off in the hive. The moisture goes to the top, or ceiling; and if it is zero cold it forms ice. I have seen ice one inch thick in the corners of the hives, and ½ inch thick all over the ceiling except 6 in. around right over the cluster, the sides covered with frost also. Strong colonies can stand this or a cold damp place for a while; but it will weaken them if it holds on long.

How well I remember the winter of 1880! I lost half of my bees; three-fourths of them died in New York outdoors. The thermometer was at zero and even 20 below for three weeks continuouslly in January. The bees I had packed with dry sawdust four to six inches deep on top with burlap or carpet, I saved. A great proportion of box-hive men lost nearly all except when they had a fly-hole half way up the hive; or when a hive was split clear from top to bottom they lived, as the moisture passed out

Brother bee-men, try both ways. Try sealed covers and carpets with dry sawdust; or forest leaves are fine—nothing better. You can get in any large city, at junk-dealers' stores, old brussels carpet for $2.00 to $2.50; 100 lbs. will cover 200 hives easily, and last eight or ten years if you keep your covers from leaking. I do not want ice inside of my hives, and it is sure to be there with sealed covers in zero weather.

Groton, N. Y.

[Perhaps this question of sealed covers and absorbents over the top of the hives during winter is one of locality. Indeed, we are quite prepared to admit that, possibly, where the winter temperature is likely to go below zero, and stay there for weeks at a time, absorbents may give better results one year with another; but in our locality it is quite to the contrary. We have tested this thing year after year, putting absorbing cushions with burlap directly over the cluster of bees on half the colonies, and a thin board, which the bees must seal down, with an absorbing cushion on top of the other half. Once in a great while we will have a winter where the two sets of colonies will run almost neck and neck; but generally those with the sealed covers come out dryer, cleaner, and fresher than those where the packing material comes directly in contact with the brood-nest itself. In the latter case the cushions become damp along in January and February, sometimes freezing. These damp cushions have a decidedly damaging effect on the colony beneath.

Then, moreover, where the moisture can pass upward through the packing the heat can escape in the same way. Under sealed covers this heat is retained. The carbonic-acid gas being heavier than air settles to the bottom of the hive, passes out at the entrance, and fresh air takes its place. The moisture precipitates and runs down the hive sides and out at the entrance also.

During the past few days (Feb. 22 to 26) we have had Mr. E. F. Atwater, of Meridian, Idaho, with us. We took him out into our yard, and showed him the difference between colonies having sealed covers and those where the moisture could pass upward through the absorbing material. He agreed with us that the hermetic sealing of the cover over the colonies he examined showed a better state of wintering. We looked over the whole yard; and where there seemed to be more dead bees at the entrance than the average we opened up the hive. In almost every case showing dead bees in abnormal numbers at the front, it was found that the cover was not sealed, and that the packing material was damp and frosty. Where there were few or no dead bees in front, the cover was sealed tight. A few we broke open, only to find that the clusters were in prime condition.

We have some four or five colonies covered with a large sheet of glass, hermetically sealed with putty. Over this is placed a tray of planer shavings, about five inches deep. We showed Mr. Atwater how, under these glass sheets, the bees were prospering, and how moisture in the form of drip was collected at the extreme corners. This moisture was remote from the cluster, and on warm days one could see the bees drinking it up. But this precipitation would appear, of course, in far greater quantity under glass than under a board, because glass is a good conductor of heat and cold. We lifted the wood-sealed covers in a few instances, and could find no drops of water except in one case, when we did notice at one corner a slight amount of dampness.

It is conceivable that moisture might form under a sealed cover, so that, during a very long zero spell, it would freeze; that more moisture would collect and form ice, and then we would perhaps have a condition more like that reported by Mr. Coggshall. But if that amount of moisture must pass up through the sawdust, or absorbent, why should it not, while it is *en route*, freeze there, forming a mass of ice and sawdust? Such a condition, unless the moisture could pass off more freely than it does with us, is not favorable to good wintering; but among the hills of York State it is possible that the air is dryer, so that this dampness would pass off more readily than here.

Later.—Since writing the foregoing we had a call from Mr. A. J. Halter, of Akron, about 20 miles east of us. He is quite an extensive beekeeper, and a close, careful observer. On referring this question of sealed covers versus absorbents, he unhesitatingly said he preferred the former. He wanted no damp, wet, or frosty packing for him.—ED.]

DRONE COMB IN SECTIONS.

Pieces of it Recommended in Place of Foundation; Many Queens Lost.

BY H. E. HARRINGTON.

On page 1487, Dec. 15, drone comb is referred to for use in supers. I have kept bees for 25 years, and the last 20 years I have used no foundation in sections. I use pieces of drone comb for starters. With a hot knife I cut the comb in pieces an inch square or larger. I heat one side

of the section over a stove, and place the comb in place (right side up), and lay the section aside for the wax to cool. I then fold the section.

This starter is very much more attractive to bees than comb foundation, as some honey will be placed in the cell before any new comb is added to it. I use no zinc, and have but little trouble because of queens laying in the drone-cells. When this does occur it is generally in sections from the previous year, nearly filled with comb, and put on early for "baits." Not more than one queen in twenty enters the sections and lays eggs. There is no "fishbone" in the sections; and as the drone comb is naturally built thicker I think I can get straighter combs without separators than if the cells were worker size. Furthermore, if the walls of all cells are of equal thickness, there is one-third or more wax in worker than in drone comb of the same thickness, and I think the honey looks much nicer, as the large cells show through the cappings more than the smaller. I can tell my customers that I have the natural comb honey with no "fishbone" in it.

Some might ask how I get this drone comb. For years I have bought but little comb foundation, using it only for starters in brood-frames. I hive my swarms on five or less frames with only starters, and in two or three days or when there are, say, five combs from one-half to two-thirds built, I put on sections with drone-comb starters, and the bees go at them with a rush. When the five combs are built I add two more frames at the center with starters. This spreading can be carried on indefinitely. The drone comb the bees build in the frames I cut out and place at the entrance so the bees can empty it of any honey that might have been placed in the cells. I then lay them away to be used in the sections. I prefer comb built from a drawn starter to that from foundation, wired or not, and I think I can get fully as much comb from the starter as I could from foundation. If there is a fairly good flow, an average colony will fill a frame in a day, or five frames in five days.

In cutting out drone comb, care must be used to cut back as far as the cells are expanded, and the bees will generally fill with worker comb, although it is hard to keep the bees from building some drone comb the second time. However, such combs should be placed at the side, where they will be used for storing honey. In the spring the drone comb can be cut out, and a piece of worker comb fitted in.

St. Johns, Ore., Dec. 25.

SOME EXPERIENCE WITH DIFFERENT BEE-APPLIANCES.

Hot Uncapping-knives Preferred; Shallow vs. Deep Supers.

BY THE NEW MEXICO CHAP.

The Bingham uncapping-knife is excellent for uncapping any kind or shape of comb except comb-honey sections. For these I made a diminutive Bingham knife with about the same drop from the tine of the handle to the tine of the blade as the regular size, but short enough for the whole blade to fit down into the section. I find such knives indispensable, and should think they might well be put on the market. We endorse the *hot-knife* plan.

This fall we extracted honey so stiff that we found it necessary to let an eight-frame power extractor hum for thirty minutes on each set of combs—fifteen minutes to each side.

Fancy uncapping *that* honey with a cold knife! Knives from boiling water had to be given time to melt their way through, and an unusually strong man at the uncapping-box complained of his wrist. The bees make a little honey here at times, which can be uncapped with cold knives without much injury to the combs; but if there is a good lively "machine man" at an eight-frame power-driven extractor, and not more than two men at the uncapping-can, they must use hot knives to keep him in honey and not ruin combs. It is fair to say that these conclusions are drawn from actual experience, for we uncapped about sixty tons of honey last summer.

We like the Rauchfuss combined section-former and foundation-fastener. We mounted twenty thousand sections with one last spring, and it gave entire satisfaction.

I have known instances where bees secreted so much more wax than they needed that it scaled off their bodies and fell in little yellow or silvery flakes on the floor of the hive, where it lay almost thick enough to cover the bottom. I note this more often in nuclei than any other place; in fact, I am not certain I ever saw it in a full-sized colony. One nucleus in which I noticed a specially large amount of these discarded wax scales was a strong nucleus (about three frames), with a poor queen which was missing a little later on

Late this season we got on to a method of brushing which was such an improvement on our old-style plan that I want to tell others about it. Take an empty comb-honey super; set it down by the hive; take off the extracting-super, set it on the empty comb-honey super, and put both back (on the hive). If the super contains 8 frames (it should contain only 7 for best results), take out one or two with the fewest bees and lean these up against the hive. Prepare a brush by tying together a bundle of soft green weeds about as large as the wrist, and two feet long. Thrust this down in the place where the frames were taken out, and sweep it back and forth quickly a few times, and no more bees will be seen there. Then pull the next frame toward you and get the brush into the opening it leaves beyond, and so on until the bees are all below.

We run for extracted honey mostly, with full-depth frames; but we have three or four hundred sets of shallow frames, and we find that, as a general rule, a man can take off honey much faster in full-depth frames, and the uncappers can uncap more pounds in full-depth frames, while the man at the extractor bewails his fate when he sees one end of the extracting-tent stacked full of shallow-frame supers. I found these shallow frames useful, however, to precede a comb-honey super.

EXTRACTING-TENTS.

We do all our extracting in a tent, and we move it from one to another of our seven yards, in which we now have 1700 colonies. The tent is a 12×16, with a 6-ft. wall. Near the back end I took out one width of canvas on each side, and put in window-screen, down to within a foot

of the ground. There are two advantages in this—first, it gives ventilation; second, robbers hang around the screens and do not bother so much at the door. If they get very bad at the door it is tied up tight, and any one wishing to get in or out raises up one side of the tent and lets it fall behind him.

Our sympathies are with the Imperial Valley bee-keepers who wish to protect themselves from the intrusion of more bee-keepers than the range will maintain, for this valley is about overstocked now; and since my partners and I have about $10,000 invested in bees here, we and others now here would hate to be crowded so as to make our project a failure in the end, both for us and the ones who crowded us.

Mesilla Park, N. M., Jan. 14.

THE QUESTION OF LOCALITY.

Why the Bees Gnawed the Splints.

BY LESLIE BURR.

Why did the bees gnaw the splints on page 1127, Sept. 15? The editor suggests that locality was the cause. The locality idea is all right in a way, as certain conditions are more likely to occur in some localities than others, but to solve the problem fully it is necessary to know what all the conditions were. In support of my idea that it was mere conditions, and not because the bees happened to be located at some certain part of the world, I will state that I have worked bees in the canyons of California, along the coast of the Caribbean Sea, among the mountains of Cuba, and the hillsides of New York, along the base of the Rocky Mountains, on the coast of the Gulf of Mexico, and on the Illinois prairies; and my observations have been that bees, under like conditions, produce like results, no matter where located.

I judge that the reasons why "a third of the combs looked like Fig. 2 and 3" are, first, there was not a heavy honey-flow; or if there was, the nights must have been very cool; and, second, the bees were given more frames than was necessary under the conditions that existed. Had the bees been given only as many frames as they could work upon, and the rest of the frames added only when necessary, I feel certain that fewer bad combs would have resulted. That "Satan finds some mischief still for idle hands to do" applies to bees as well as boys.

BEES DESERTING THE HIVE.

While in the West I heard what then seemed a strange story. It was to the effect that a Colorado bee-keeper who had business interests in Montana decided to go into the bee business there; but on making inquiries about bees he found it was not an uncommon occurrence for them to desert the hive and disappear, leaving scarcely a bee with the honey and brood.

The person in question decided that, if bees acted that way, he had no desire to own bees in Montana.

I could never account for the bees acting this way until a few days ago when I was visiting Claude Hill, of Chagrin Falls, Ohio, one of my old Cuban friends. In the course of our conversation about Cuba he remarked, "Say, did you ever know that down on the south coast of Cuba at times the bees have been known to desert the hive, leaving it full of honey and brood?" He gave as a reason that the bees had become crazy from thirst, there being no fresh water that they could get.

ENTRANCE-BOARDS.

The editor, in his remarks about that photo of T. C. Ebrito's apiary, in the Sept. 15th issue, says, "The arrangement of the hive-stands, also, is very simple, and has the further advantage that it permits the apiarist to push his toes or insteps clear under the hives. This allows him to get near his work." This is all true; but let me add that there should be a board that reaches from the entrance to the ground; for if you do not (and this is especially true in the North) a large number of loaded bees will become lost. I remember one day during the buckwheat flow in New York this fall I chanced upon a hive about six inches from the ground. The small board that leaned against the entrance had fallen, and, as a result, there was about a pint of bees crawling around near the hive. They had missed the entrance; and as there was no convenient way for them to crawl up, and they were too exhausted to take wing, they were unable to enter the hive.

Valparaiso, Ind.

DO BEES HEAR?

Some Evidence to Show that Bees Notice Sounds by Feeling the Jar.

BY I. W. BECKWITH.

This is a question that will not stay down, and I will offer some observations that I have made in regard to it.

The "do-hear" party says, "We notice that a sharp clap of thunder sends home in a hurry the bees that are out foraging. Did they hear that thunder? When hiving a swarm, those near the entrance commence humming and marching in; then the others take up the hum and march. When a colony is preparing to swarm, the old queen and the unhatched one quahk at each other. Of what use is that quahk if the other queen does not hear it?"

H. v. Buttel-Reepen, Ph. D., says, in his article, "Are Bees Reflex Machines?" that he has not the least doubt that bees have an excellent sense of hearing, since observations yield hundreds of proofs; but admits that no organ of hearing has been discovered.

But there are observations and observations. I have seen many things, however, that go to show that the bees do not hear as we do, although they are sensible to sound. I have often noticed, when hiving a swarm, if there should be a gap of two or three inches between those bees that are humming and going into the hive, and those further away, they do not seem to hear that hum across the gap, especially if there is a little wind toward the hive; yet I can hear it several steps away. Those bees did not have a very "excellent sense of hearing."

I set up a screen of tissue paper about six inches from the front of a hive, and shook some bees from a comb on to a sheet between the hive and

screen, and also shook some bees on to the sheet back of the screen The bees inside commenced humming, and marched into the hive; but those outside did not seem to hear the noise, though there was but the thickness of paper between. I lifted the screen an inch or two, and those bees immediately commenced to hum. I closed the opening and they stopped This I repeated several times with uniform result. I then removed the screen and replaced it with one of mosquito-bar, and the bees heard (?) through that all right.

The bees did not hear the humming in either case; they simply felt the motion of the air the same as I do when a bee alights on my face and hums. The above experiment is very easily tried, and the truth of what I have said verified.

"But did not the bees hear that thunder?" No. They only felt the jar, the same as a deaf person does, or as I do if I chance to have my hand on the table.

"If bees do not hear, of what use is the quahking?" I am something of a Yankee, and will answer accordingly. If bees *do* hear, of what use is the quahking?

Lander, Wyoming.

A HARD WINTER FOR BEES IN CELLARS.

Colonies in Winter Repositories in Danger.

BY R. F. HOLTERMANN.

During my twenty-six years of experience with bee-keeping there has never been such danger for the bees wintered in the cellar as there is this winter. The changes of temperature have been very rapid. For instance, on Jan. 4 the bees of a colony that I was wintering outside had a flight; on the 5th the temperature was 20 above zero, and on the 6th 20 degrees below. Within another 24 hours it was 26 degrees above zero. With such rapid changes it is a very difficult matter to keep an even temperature in a cellar, and even more difficult to make a change of air practical. I do not know whether it is correct; but a recent statement was made in one of the papers that this was the mildest winter in New York and Pennsylvania within the memory of man. Under these circumstances bees wintered inside, unless they have the greatest possible care, will suffer materially, and I already have evidence that this is the case.

The editorial, page 72, Feb. 1, was very opportune, and I fully indorse it. It is now several years since I stated in GLEANINGS that bees, being animals, require air, and the longer I keep bees the more I am convinced that they require and use to advantage even more air than I then thought. This winter, even when the temperature in the cellar was kept down to 43 degrees, I had two twelve-inch sub-earth ducts, the intake pipe running under the ground a distance of about 90 feet, and entering at the middle of the cellar floor. I also had four six-inch sub-earth pipes, but these were much shorter, and were in pairs, each pair coming through the cellar floor half way between the two twelve-inch pipes and the ends of the cellar. All these were to bring in fresh air. A large chimney, with two eight-inch stovepipe holes, carried the foul air from the cellar floor, and I had two fourteen-inch shafts for the same purpose leading from the ceiling. These latter were to be used during warm weather only. In spite of this I found that these provisions for ventilation were entirely inadequate. From the bee-yard to the bee-cellar there is a stairway five feet wide, which can be closed at the top and bottom by double doors meeting in the center. In the fall or early winter, after putting the bees in I began leaving these doors entirely open. About a week before Christmas, during decidedly cold weather the doors were partially closed; but until this date (Feb. 9) they have never been entirely closed. We shut out the light as much as we can, and we have darkened the windows of the room upstairs and kept the trap-door open more or less, which leads down into the cellar.

The bees nearest the fresh air in the entire front row, which is at right angles to the outside stairway, and which consists of five rows of hives 25 feet long, placed one above the other, appear to be in perfect condition. There are very few dead bees on the ground under this row. The next two rows are of the same dimensions, and face each other with only room enough to walk between them. The hives in these two rows have very few dead bees, but still there are more than in the first row, and there is a little spotting, though not much. The hives in these two rows are almost unspotted. Beyond these are two more rows in the end of the cellar, the last row having the backs of the hives against the end wall. There are more dead bees under these last two rows, and two of the colonies at this date show decided signs of spotting the hives. The bees are also more easily disturbed, and the temperature is always several degrees higher than that more toward the center of the cellar. This can be accounted for only by defective circulation. One twelve-frame Carniolan colony having over it only a thin cloth, and a corner of that folded back, had a bunch of bees the size of my two hands hanging out on the front of the hive. There were no distended bees, nor was there any spotting. The temperature at this time was 50°.

The other end of the cellar was much the same. Some weeks ago I cut an opening about 14 inches square through the cellar into the room above, over the center of the end row, and yesterday I cut two more holes, building a sort of chimney over each opening in the floor of the room above by means of half a dozen empty twelve-frame supers. I find that these openings are giving excellent satisfaction; and if I could follow Mr. Aspinwall's advice, and make the entire ceiling of the cellar of slats with straw on top, I have no doubt I should have an ideal arrangement.

As long as the air is fresh, very few bees fly from the entrance of the hives, even when the temperature is 50 degrees; but as the temperature rises the bees become more active, and they require more oxygen, as at such times the bees under ordinary conditions are likely to get the least ventilation, for the reason that the inside and outside temperatures are more nearly.

Those having difficulty in ventilating cellars should aim to have a maximum of fresh air, even at the sacrifice of uniformity of temperature; but

at the same time the direct light should be covered so that the least amount of it will reach the bees. When increasing the ventilation it would be better to manage so that increased light will not be given at the same time. It would be better to do this at night, so that, when the morning light comes, little by little, it will not have so much effect on the bees.

Brantford, Ontario, Canada.

[A few years ago the statement went out, and scarcely any one came forward to controvert it, that bee-cellars required little or no ventilation; that sub-earth ventilators and all others were worse than useless. Such mischievous doctrine had a serious result on the industry, for many beginners, as well as veterans, attempting to follow such advice, came to grief.

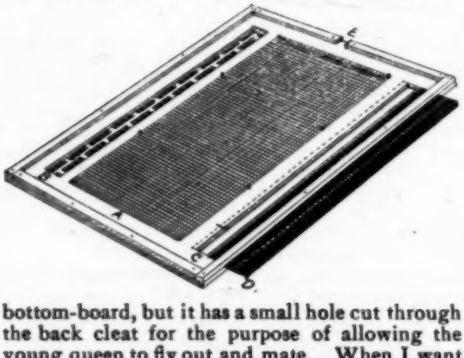
Now, in cases where the temperature is variable it is beginning to be conceded that fresh air in large volumes is an essential factor for indoor wintering.

In a state of semi-hibernation, when the cellar temperature is uniformly 45° F., during which respiration is low, not much air is needed; but when that condition is changed to activity and restlessness, then there must be copious ventilation or there will be trouble.—ED.]

REQUEENING BY SUPERSEDING THE OLD QUEEN IN A NATURAL WAY.

BY J. E. CHAMBERS.

Having received quite a number of inquiries about my requeening device, mentioned on page 1089, Aug. 15, 1907, I would say this device consists of a thin board, with a large part of the center cut out, and covered on both sides with wire cloth. At each side there is a slot cut out almost the length of the board. One of these slots is covered with zinc, the other with a tin slide that can be pulled out when necessary, leaving the slot entirely open. The board is cleated like a



bottom-board, but it has a small hole cut through the back cleat for the purpose of allowing the young queen to fly out and mate. When I want to requeen a colony that has a failing queen I put a few empty combs into a hive-body, and also a comb of all sealed brood; set the above-described board over the hive to be requeened, and put the body containing the combs on it. Then I run in a young virgin just hatched, or give a mature cell in a good cell protector, leaving the flight-hole in the rear of the board open. On the seventh day I pull out the tin slide that covers the open hole, and thus allow the young queen to go below. She slips down very quietly; the bees pay no attention to her, for she has been among them for several days, and has acquired their colony odor. Even the old queen does not become alarmed until the young queen is struggling with her in mortal combat. Since a worn-out queen is no match for a young vigorous one, not yet heavy with eggs, the old queen is killed and the young one reigns.

It is unnecessary, of course, to explain to the intelligent bee-keeper why this result will almost invariably occur. The failing condition of the old queen is an important factor, but by no means the most important one. The young queen acquiring the scent of the colony, and mating from the hive containing a part of the colony, is the main factor. It does not matter if the old queen below is not yet played out—almost exact superseding conditions are brought about, and the bees do not reason.

Perhaps some will ask why they can not put a mature cell into a protector and then insert it right among the bees. This will not work except when the bees are already making preparations to do the superseding themselves. One main reason is, that *the queen just hatched is no match for the old one.* But after she has had time to acquire her full strength, it is different. Furthermore, the bees pay no attention to the new queen, and thus do not hamper her actions in the least.

QUEENS WITH STINGS CLIPPED.

In this connection I wish to mention an experiment I had the good fortune to witness the past summer at Uvalde. I was visiting Mr. E. L. Bussey, and he was experimenting with introducing a plurality of queens into several colonies. He showed me a colony in which were two queens with stings clipped. They had been there several days, and when the hive was opened the bees were paying not the least attention to the queens. But the queens were biting and pulling at each other in a savage manner. In every case, Mr. Bussey afterward informed me, one queen was found missing after a few days. However, the value of the experiment was partly lost through his failure to mark the queens in such a way as to enable him to know whether it was invariably the old one that was killed.

San Angelo, Tex.

[This requeening-board, taking advantage of the supersedure impulse, is, we believe, a good thing. The whole theory of its working is sound.—ED.]

BEE-KEEPING IN LOWER CALIFORNIA.

"Enough Honey Produced to Float the United States Navy;" Many Bees and Few Bee-keepers.

BY JAMES H. LYONS.

This is one of the greatest bee countries in the world—a territory from 50 to 150 miles wide, and 800 miles long, having only one apiary, and that one conducted in a very rudimentary manner. There is not one movable-frame hive on the peninsula of Lower California.

Last March I started with 40 colonies of mixed bees, mostly hybrids, in different kinds of hives or boxes, cracker-boxes, health-food boxes, soap-boxes, corn and tomato boxes, fruit-crates, and coal-oil cases; I have increased to 104 colonies, captured four or five colonies of wild bees that came along, and lost by absconding between 25 and 30 colonies. The bees commenced swarming about March 1, and kept it up until after July 15. This country is full of wild bees. I found 5 colonies in rocks in half a day without lining or tracing, simply running on to them. I will take their honey and wax in a few days, as the best of the season is over with now (July 13).

There are wild bees all over, and the people here say there is enough honey made each year on this peninsula to float the United States navy. A native said he knew of 100 swarms in one mile, in the walls and rocks of a canyon. It is usually safe to believe nothing we hear, and only half what we see down here. I am sure there are hundreds of thousands of colonies of wild bees on this peninsula.

Natives say this is a poor season for bees; nevertheless, from my 40 colonies last spring and their increase I have taken 1200 lbs. of comb honey, which sells for 20 cents, Mexican money, per lb., equal to 10 cts. in United States currency. Beeswax here at Ensenada is worth one dollar, Mexican, per kilo. A kilo equals 2⅕ lbs.

Bees here usually make some honey all the year round, as the temperature ("they say") ranges from 50 to 75 degrees; anyhow, it was somewhere between those two points from Feb. 1 to July 13, 1908.

The main honey-plants are blue and white sage, and two very abundant plants with yellow flowers from which a fine-flavored thick amber-colored honey is made (better than sage honey); then here are ice-plant and cacti, eucalyptus and orange blossoms, and a thousand other flowers.

The Indians (my only competitors), bring in considerable strained honey from the wild bees, of dubious quality and cleanliness, which they sell for one dollar, Mexican, per gallon in five-gallon coal-oil cans, or 25 cents per bottle in beer-bottles. I shall sulphur 40 colonies about Aug. 1, and try to get the rest into Langstroth hives. The only natural enemies of bees is the bee-martin. I set small No. 0 traps on the top of posts near the hives, and have caught the most of them. Bee-moths are here also; they have not bothered much yet, but I suppose they will later, and I should like some of your contributors to tell of the best way to control them.

Ensenada, Lower Cal., July 13.

[This is indeed a bee paradise. We should be pleased to hear from others who reside in this wonderful bee country. Possibly and probably our correspondent has heard only of the rosy side. Is there a dark side? Let's hear from others.—ED.]

WINTERING IN A WARM ROOM.

The Plan a Success, but it Causes the Bees to Breed up too Early for the Harvest.

BY F. H. CYRENIUS.

Having had a number of years' experience with the warm-room plan of wintering I think it may be of use to my brother bee-keepers to state what I know about it. That the plan can be carried out, there is no doubt. Set the hive in a good comfortable living-room, with the temperature 65 to 70, and as long as the entrance communicates outdoors they will be quiet, and winter nicely.

I made my first experiments about fifteen years ago, and in our Northern New York climate I was happily surprised in March to find three or four frames of brood all nearly ready for the harvest in April. I soon learned something else. The hives were soon crowded with willing workers, but there was nothing for them to do but eat. That was not all. The queens seemed to have laid their rush of eggs, and were ready to retrench somewhat, just as we wish them to do before the honey-flow. There are times when an oversupply of bees is a detriment instead of a benefit. One of those times is a few weeks before the honey-flow, and another after it has gone. The colonies that store the most honey are the ones that reach the strongest point just as the flow begins. Under these conditions every thing is at its best, and something is doing.

I have no doubt that a small proportion of our bees could advantageously be used to give a frame of this hatching brood to the weaker colonies; but here is another caution: The frames in the warm room will be filled from end to end; and to insert this frame in a weak colony would mean that some of the brood would be beyond the cluster; but it could be used in the strongest colonies in place of combs not so well filled, which could be used in weak colonies to good advantage.

Could we remove our bees from their winter repositories to the warm room early in April we could bring them up about right; but *the colony wintered in the warm room will be too far in advance of the season to be profitable.*

Some ten years ago I placed two hives in an outer case in such a way that a kerosene-lamp kept the temperature from 70 to 80 nearly all through April. The result was phenomenal, while subsequent experiments proved failures. I presume the smell of the oil had something to do with the failures.

To sum up, I will say that large opportunities await the bee-keeper who can successfully use artificial heat during April. I think the house-apiary will give the proper opportunity by using a stove in zero weather to take off the chill, and to give a high temperature beginning about April 10.

Oswego, N. Y., Feb. 22.

TEN COLONIES KEPT IN A HOUSE PERMANENTLY.

I have had one colony on my third floor for three years, and it did so well that I put nine more in the house last summer, all in observation hives. They winter much better than those outdoors, and, no matter how warm it is in the house, the bees will not fly out more than those outside. If I had room I would not hesitate one minute to put fifty or sixty colonies in the house.

Bees gathered pollen Feb. 16, 1909, and on every day since then when warm enough.

Reading, Penn. JOHN RICK.

HEADS OF GRAIN

FROM DIFFERENT FIELDS

BEE-KEEPING AND FARMING; A GOOD SHOWING.

White clover is about all dead here, but about three-fourths of the alsike is alive. I don't expect much honey next season.

I have been keeping bees since I was nine years old; am 64 now. I have four yards of bees strung out for twelve miles. I tend them myself, and oversee the farm. I sold $1530 worth of honey last year. HENRY HASTINGS.

Kenton, O., Jan. 12.

DO BEES OF ONE COLONY ALWAYS WORK ON ONE KIND OF FLOWER?

If it is not always true that all the bees of the hive work at one time upon one kind of flower, p. 18, Jan. 1, it certainly is true sometimes, for I have many times noticed and wondered at the difference in the surplus honey from different hives standing perhaps side by side. One may have dark honey or honey with a strong tarweed flavor, while the other has fine light-colored honey with a superb flavor. J. P. R. HALL.

Bostonia, Cal., Jan. 13.

SPLINTS AND WIRE FOR SUPPORTING FOUNDATION; THE ALEXANDER METHOD OF EXTRACTING AND FEEDING BACK INDORSED.

My experience with Dr. Miller's idea of wooden splints for supporting foundation has shown me that the splints are all right when used with wire; but when used alone there seems to be too much warping. If splints are too long they are not satisfactory; and if used out of season for comb-building, say in July, they are eaten off at the bottom and some in the middle. If the honey-flow is good, the splints and wire together make an ideal support.

I was well pleased with the Alexander method of extracting honey from combs in the spring, and feeding it back. I extracted three combs from each hive, and fed it back with some sugar syrup, and my colonies were just booming by apple-blossom time. I intend to try it again next spring. GEO. A. MATHEWS.

Bedford Station, N. Y.

UNCAPPING WITH BOTH AN UPWARD AND DOWNWARD STROKE; THE COLD KNIFE PREFERRED; THE HEDDON CLOSED-END FRAME FOR EXTRACTING.

The first eight years of my experience I used a heated knife; but I found I could do just as good work with the cold knife, and did not have the bother of heating water, and saved the cost of fuel in heating it. I think I can do more rapid work with the cold knife, as I do not have to place the knife in the water, and I also save the honey that adheres to the knife.

I use both the upward and downward stroke in uncapping. The first stroke downward takes about two-thirds of the capping clear to the end-bar. The upward stroke finishes the work to the other end-bar. I thus get the use of both edges of the uncapping-knife, and have a sharp knife longer than I would if I used only one edge in cutting all one way. I can say that I prefer the cold knife to the hot one. I have used the cold knife nine years.

I have three kinds of extracting-frames—the regular Hoffman, full size; the half-depth Hoffman, and the Heddon frame. The Heddon beats them all for easy uncapping, and is my preference for an extracting-frame. D. I. WAGAR.

Flat Rock, Mich.

A STRAIGHT-HANDLED KNIFE PREFERRED.

According to my experience, Dr. Miller is right when he says in his fourth Straw, p. 1303, Nov. 1, "Are not those places depressions, and would they not be better reached with a straight handle and a curved blade?" I have always used a straight-handled knife with practically a straight edge, except about a quarter of its length, which tapers with a long curve toward the point. I ask for nothing better.

The main features of a serviceable uncapping-knife are a thin blade, but not one too flexible, faultlessly bright, and an almost razor edge; and, I emphasize, the more scrupulously bright and sharp, the more and better work it will do. I have never found it necessary to warm or heat an uncapping-knife, and consider all arrangements for this purpose a waste of time and labor.

It is also necessary that the blade reach clear across the frame, with a little to spare, although I hardly ever find combs as wide as the Jumbo, which I use, that can be uncapped with one stroke. There are generally a few depressions toward the bottom-bar that have to be touched with the curve. With frames five or six inches wide, one stroke will do the business in most cases; and I feel somewhat like Mr. Hutchinson, of the *Review*. I should like to race it with an uncapping-machine.

FEATHERS FOR BEE-BRUSHES.

It has been claimed by otherwise good authority that the use of feathers for brushing bees has a tendency to make them cross. This is not so, if we accept the experience of many years as conclusive evidence. I know from close watching, having used different kinds of brushes, that there is nothing about a feather that will irritate bees any more than any other material that may be used as a brush. During extracting-time I do a great deal of brushing, using a feather, of course, and I very seldom use a veil. I always keep a number of feathers scattered all through the bee-yard. They are placed between cover and cleat, where they are held in horizontal position in plain sight and easy reach from any place where I may happen to need them. But generally, when I expect the steady use of a feather, I carry one in my hip-pocket. G. C. GREINER.

La Salle, N. Y.

A SUGGESTED IMPROVEMENT IN EXTRACTORS.

I have often thought that, if the cans for four-frame extractors were made as large as those for the six-frame, it would be a great improvement. It would also be a help if there were a funnel-shaped guide at the top of the comb-baskets in order to lessen the time needed for placing the combs in the baskets. When there is only half an inch of room to spare we often waste time in getting the combs in.

Mangas, Cuba. C. F. HOCHSTEIN.

On page 157 of the A B C book you advocate a plurality of hive entrances. How is it to be arranged in the ordinary Dovetailed hive?

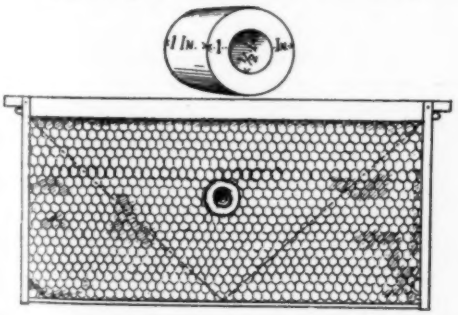
Windom, Pa. ENOS H. HESS.

[The usual method of making entrances in the extra stories is to bore a ¾-inch hole through the hive end near the top This should be capable of being closed by means of a wooden button whenever desired. Where there are only two stories it is sometimes customary to lift up the cover in the rear by about ¼ or ½ inch, depending upon the size of the colony. If you merely desire to try it for experimental purposes, pry apart the rear of contiguous stories by about ¼ inch. This wide opening should be reduced by putting in wedge-shaped strips on the side, and short cleats at the ends. While the bees will build a surplus of burr-combs made by this increased gap at the back end, it will do no harm, and yet enable you to determine whether the plan is a success with you or not.—ED.]

PROVIDING PERMANENT MEANS FOR COMMUNICATION THROUGH THE CENTER OF COMBS.

The article on page 1381, Nov. 15, on outdoor wintering, is one that I wish to indorse, for I have followed for a great many years the plan recommended, and have always been entirely successful. However, I am not satisfied with a mere hole cut in the comb, for I go a step further and insert in every comb a round wooden plug with a half-inch hole bored in the center. In this way a permanent passage is afforded, and I do not have to repeat the cutting every fall, as Mr. Fluharty does, for the bees do not fill up this hole in the spring.

The engraving represents a frame of wired foundation with the plug inserted in the center. The diameter of the plug is one inch, and it is one inch thick. To make these plugs I put a mop-handle in a vise and bore a half-inch hole through it lengthwise for four or five inches, and



then cut it up as far as the hole extends, in pieces an inch long. When I first used this plan I tried a larger hole, but the bees generally filled it up with comb in the spring; and since I adopted the half-inch size I have met with entire success, and have never found one closed up.

Some may say that the bees will gnaw these plugs and try to tear them out. This is true in some instances; but if the hole that is cut in the foundation or in the comb, as the case may be, to receive the plug, is just the right size, and then if the edges of the comb close to the plug are painted with melted wax, the comb will be perfectly attached to the plug all around, during comb-building time. I would not advise any one to try putting in plugs at any other time.

This method comes very near providing the easy access from comb to comb that is found in the old box hives. Those who are familiar with the uniformly good results from box hives realize that they provide conditions that are the very best for bees during the winter. With this plan, brood will often be found in almost every comb if the queen is prolific; and for early spring breeding such a passageway from comb to comb is just what the queen requires to enable her to pass freely from one comb to another without leaving the cluster. WM. J. HAYES.

New York.

VENTILATION NEEDED AT THE TOP OF HIVES IN WINTER; WIDE SPACING.

On p. 35, Jan. 1, Mr. Crane, in his first paragraph, seems to think that straight combs are the cause of bad wintering. I don't think so, for bees winter in our modern hives just as well as in old boxes or logs if the proper ventilation is provided. Moisture rises with the air; and if there is a place for it to get out the cluster is always dry. Dry bees and dry combs are sure to winter well. In almost every tree there is more or less decayed wood above the cluster, and the ants make holes to the outside, through which the moisture escapes. Give the bees less ventilation at the entrance, and a little above, and they will winter better. Put on an escape-board early in the fall so the bees can have time to seal it down. Leave out the escape and put the roof on loosely, and see how much better the bees winter. If packing is used on top, put some wire cloth over the hole in the board.

Our frames are spaced too close, as Mr. Crane says. They ought to be 1½ from center to center. Bees can not cluster thick enough between closely spaced combs, and that means that they must spread out. In such a condition it takes more honey to keep up the heat; and the more honey they use in the winter, the shorter-lived they are in the spring. My bees wintered outdoors last winter, and the greatest loss in stores was 8 lbs., and the least was 4½ lbs. This was from Dec. 1 to April 1, and my hives were just boiling with bees when alsike bloomed, May 20.

RALEIGH THOMPSON.

Underwood, Ind.

[There is no doubt that upward ventilation through dry absorbents furnishes an ideal condition for outdoor wintering; but the difficulty lies in the fact that it is almost impossible to keep these absorbents from becoming very damp, and freezing in winter. Experience shows that, in the average case, it is better to have the top of the hive sealed tight, with a generous amount of packing over and around the hive. It goes without saying, that this packing must be kept dry by a storm-proof covering.—ED.]

COMB HONEY TWENTY YEARS OLD IN GOOD CONDITION AND OF GOOD FLAVOR.

In the Dec. 1st issue, page 1437, you give cuts of comb honey said to be twelve years old. Some twenty years ago I concluded to see how long I

could keep comb honey. I took twelve sections each, of basswood and white clover, putting them in a twenty-four section case, storing them in a closet adjoining our dining-room. It never freezes in this room. For two or three years following I took out a few sections, replacing them with that year's product. In the last two or three years we have been giving the honey a trial to see what it was like. Some of the combs were somewhat granulated, others not in the least. I have just looked to see what is left. I find one section dated 1889, one 1890, two 1891, one 1892, and one 1893. The color is that of any white two years old. The flavor is very fine, consistency thick and ropy, as it will string out a foot or more without breaking. Taking color, flavor, and consistency, I think the clover is a little ahead of the basswood. J. W. CALDWELL, M. D.

Steamboat Rock, Iowa.

[This is interesting as well as remarkable. We never had the record before of any honey in the comb as old as this—certainly not if we take into consideration condition and quality. Can any one go one better?—ED.]

A PLAN PROPOSED FOR THE INSPECTION OF BEES IMPORTED INTO HAWAII.

That importation of queens into Hawaii reads funny, p. 1490, Dec. 1. Let us imagine they did not consult a practical bee-keeper before framing the law. If the island is going to have a law for the protection of disease, why not have a quarantine station five or six miles from any other colony of bees, and let the importer bring nuclei to the station, and have the queen introduced on arrival? then the brood could be inspected once or twice a week for one month; and if nothing broke out in that time, give the importer a clear bill of health for his queens. ISAAC BALMER.

Burlington, Ont., Can.

SWARMS WITH VIRGINS LEAVE PARENT COLONY HOPELESSLY QUEENLESS.

Referring to Dr. Miller's Straw, page 988, Aug. 15, I would say that, while I lived in Iowa, I thought I could depend upon a colony not to swarm with a virgin queen and leave the parent hive hopelessly queenless; but here, with the same strain of bees, it has been of rather frequent occurrence. I have known swarms to issue repeatedly and return, the young queen failing to go with them until at last she would "yield to popular opinion" and swarm too. It was evidently no "bridal party," but a *bona-fide* leaving for parts unknown (to me). The usual amount of bees would always remain in the old hive.

Leslie, Ga., Aug. 21. T. W. LIVINGSTON.

COMB-BUILDING IN TREES; DEATH-RATE OF COLONIES IN TREES GREATER THAN IN MODERN HIVES.

Bees follow no rigid methods in sheeting their combs in box hives or in trees. The central combs in all box hives or trees are invariably straight and methodically spaced, showing a preference for uniformity, but the rest of the work is quite crooked. At the beginning of work in any hive all operations are influenced by the queen's persistence in laying eggs; and thus it is that the central combs are always true and flat; but as soon as the queen, according to her prolificness and the flow of nectar, has plenty of brood space, the crookedness of work materializes.

The form of the hive influences comb-construction more than any other thing; but the impression that bees in a Langstroth hive are working under abnormal conditions or following unnatural impulses is, in my opinion, radically wrong. It seems to me that any effort on our part to guide normal colonies to finish all operations in nature's symmetry is a step forward. As to wintering—well, combs built in Langstroth hives with Hoffman frames are just as favorable to ideal results as combs built any old way, J. A. Crane, p. 35, Jan. 1, notwithstanding. The death-rate of bees in trees far surpasses that of those in L. hives, and to find the real cause necessitates rigid search elsewhere than in comb construction.

Great Meadows, N. J. RALPH P. FISHER.

STRONG-TASTING COMB.

I have one super which was well filled with nice white honey except three sections in the center, which were a dark-brown color. I gave one to a neighbor. They did not like the taste of it. We used one ourselves. It is the comb that is strong and does not taste good. When you take the honey out of the comb and compare it with the white comb honey you can not see any difference in color or taste. The comb has the appearance of being made of propolis, and the comb is thicker than the white comb. Now if you can explain this I should be glad to hear from you. COLUMBUS MILLS

Gas City, Ind., Dec. 8.

[A comb in the process of building partakes somewhat of its surroundings. If it is next to old dark combs it takes on somewhat their character and color.—ED.]

VERY LITTLE WHITE CLOVER LIVING; JOINING NATIONAL BEE-KEEPERS' ASSOCIATION.

I have found very little white clover living, but there is an abundant crop of seed. There is very little red clover.

I just started to keep bees only this last summer, and would thank you very much if you could tell me how I could join the National Bee-keepers' Association. WM. HOSIER, JR.

Terre Haute, Ind., Jan. 11.

[Write to N. E. France, Platteville, Wis., enclosing $1 00 for membership.—ED.]

WOULD IT BE A GOOD PLAN TO UNITE WEAK COLONIES FROM THE CELLAR IN THE SPRING?

I have read about uniting weak colonies of bees in the fall when putting them in the cellar. How will it work, when taking them out in the spring, to unite light or weak colonies and let them mix while taking their cleansing flight? Would you put any thing between the two hives when they are united? CHAS. DOAN.

Hull, Iowa, Jan. 7.

[The plan is perfectly feasible, and, indeed, is practical to a considerable extent.—ED.]

OUR HOMES

BY A. I. ROOT

That thy days may be long upon the land which the Lord thy God giveth thee.—EX. 20:12.

Before considering the text I have chosen, I wish to take up another matter briefly. The following letter from a reader of GLEANINGS will introduce it:

Mr. A. I. Root:—GLEANINGS is growing better and larger from year to year. This surely must be encouraging to all Rootville and especially to its founder, our dear old "Uncle Amos." I wonder whether the management finds it easy to keep the ball rolling, and whether they would take it amiss if a reader would put his shoulder to the wheel and give it a little impetus, or at least help them with a little suggestion.

My attention was called to an inconsistency existing between the heading of the Home papers and the subject matter, or between the text and the sermon. This matter was brought up some years ago, in a small gathering of ministers, several of whom were bee-keepers. I was reminded of this when I read the beautiful text, Isa. 52:7 in the Christmas number, expecting to read a genuine Christmas sermon full of the peace and love of God, as was that first Christmas sermon delivered by the angel to the shepherds: "Fear not, for behold, I bring you good tidings of great joy which shall be to all people. For unto you is born this day in the city of David a Savior, which is Christ the Lord." Instead of this I found an article on *shoes* and *feet*, which would have looked well under the heading of Health Notes; but under this beautiful text from holy Scripture it looks—to me at least—ridiculous. Yes, it seems to me as if the holy name or word of the Lord is taken in vain. Where the appropriateness of the text comes in I utterly fail to see. It is true, the word "feet" appears in the text, the word being used in a flowery way to express as much as the "coming of," the same as if we say, "It makes me glad to see the approaching carriage of my friend." It is the *friend*, not the carriage, that gladdens me. Well, I am not a preacher, and may be the meaning of a text is immaterial in these days of which the Lord speaks—Matt. 24. We may be glad if we are permitted at least to hear the Bible text read in some of our churches; but it always comes up in my mind again, "Have these preachers never come across the passage where Jesus said, 'But in vain they worship me, teaching for doctrines the commandments of men'?"

Yours for improvement all around,

MRS. I. B. G.

My good friend Mrs. I. B. G., while I thank you for your kind criticism, and while I plead guilty, at least to a certain extent, I want to offer a little defense. You were disappointed because I, a poor humble layman, did not give you such a Chr stmas sermon as you hear from almost every pulpit year after year as this sacred holiday comes along. I know, and have known for years, that the message God gives me to present in my own way does not always fit very well with the precious words I select as well as I can to place at the head of my talk. May I confide to you all right here that for years past I have at times felt as if it was, as you put it, "ridiculous" to think of putting such poor efforts in print? But there was no time even to *try* to write something better; neither had I at the time the brains and energy to get up something else quick. All I could do was to ask God to send his Holy Spirit along with it so that it might be understood and bear fruit. When a host of kind words came from far and near in regard to that very Home paper I began to conclude it was Satan that tried to persuade me I was off my base (just as he did when I was in that great barber-shop in Atlanta), and I can now think of only two Home papers that ever went into the waste-basket in over thirty years.

Now, my dear Christian friend, may I not make a brief defense of that paper about "beautiful feet"? Is there any thing we can do to make our feet beautiful in the sight of both God and man like what the text brings out so clearly—keeping them busy in "bringing good tidings" and "publishing peace," and, best of all, "publishing *salvation*"?

Can you imagine any "good tidings" of more moment to the world than that "emancipation" which the missionaries have, by their "busy feet," brought about in China? Let me repeat it, *millions* of *women*, crippled for life for more than a *thousand years* past, and this thing going on and *on!*

Let me digress a little. A few months ago, at a conference of ministers they were discussing county local option. When I found I was the only layman present I apologized, and was about to withdraw, when one of them who knew of these Home papers said:

"Friends, some of us here may in time get to be great preachers; but there is little hope or prospect that we shall ever speak to as great an audience as our friend here talks to twice every month."

How does it come that I have such an audience, and have held on to it for years? Because sometimes "God hath chosen the foolish things of the world to confound the wise," etc., and because I have called attention to great evils like the crippling of the poor Chinese women's feet. To come back to our own country, is not this man who advertises the common-sense shoe, and ignores fashion, "publishing peace" to a silly and sinful world that would destroy both *feet* and *spirituality* rather than be out of fashion? Few of the Home talks have brought more responses and kind words than the one about shoes and feet; and I am sure it has helped push along a needed reform, even if it was, in some respects, perhaps, a little off from the usual interpretation of that beautiful text.

Now for the text I have chosen for my talk today. I feel sorry about it, but I fear it is open to the same objection as the one we have been discussing. I have taken it from the commandment about honoring the father and mother, and yet I propose to discuss mainly *long living*. I do this because I have not found any thing in the Bible that hits so exactly what I want. My talk has been planned mostly for old folks like Mrs. Root and myself. Our fathers and mothers are dead and gone. They did their duty by us, and have ceased from their labors, but I feel sure they are looking down from their home in heaven in a loving way as of old, watching anxiously, perhaps, to see what progress we are making out of the darkness and into the light that the Heavenly Father has all these years been holding out before us.

Now, then, what shall we do that *our* "days may be long on the land," etc.? After having been loyal and filial to our parents and *all* our relatives we are to take care of these bodies of ours. Much of my correspondence of late has been from elderly people who have been considering coming to Florida to avoid the rigid winters of the North. After having passed five or six winters in a southern clime I do think many old people will live longer and happier by getting where they can be more in the open air, and at the same time avoid being "bundled up" as we must be in a cold climate. From the fact that so many old people drop off during the winter

time, I am convinced that large numbers might live perhaps several years could the winters be bridged over. Old people get chilled, and I know by experience it is often quite a task to get thoroughly "warmed up." When away from home I sometimes wake up in the night cold, and at such times it seems almost impossible to get warm, no matter how much clothing I pile on. This often happens when I have been out and gotten pretty well chilled during the day.

Well, this winter Mrs. Root and I have discovered a beautiful remedy. Of course, it is "as old as the hills," almost; but it is new to us. I told you about our fireplace that we scarcely used last winter. Well, this winter we have used it and enjoyed it. Our testimony is now emphatic, that, of all the inventions for keeping people warm (especially old people), there is nothing to compare with the open fireplace. Ours is large enough so we can bring in a "backlog," almost as long and as big around as myself, and then with a very little small fuel we can keep the heat just right. The radiated heat and the abundant ventilation are, one or both, an inspiration for work or sleep, or any thing else. My old father's remedy for a cold was to "toast the feet" before an open fireplace When your feet are well toasted you are pretty sure to be toasted also, pretty well all over, and after this "thorough warming-up" you can lie down under the warm blankets before the open window, right in almost any kind of drafts, and "sleep the sleep of the just," and not take cold a particle. I have been here now nearly three months, and have had nothing that could be called a cold, or, for that matter, *any other* trouble. Of course, I am careful of my diet—no sugar to speak of, and very little meat. Mrs. Root and I are both using the Battle Creek health foods, and greatly enjoy them. The saving in housework is immense, and "dinner" is always ready. I was much pleased to find in the last *Practical Farmer*, in Terry's department, the following, especially as the individual is the father of our Mr. J. T. Calvert:

NOT TOO OLD TO GET WELL.

A Vermont reader asks: "Is there any hope that a man 60 years old can cure himself of asthma of 30 years' standing by right living? My mother suffers from rheumatism and heart trouble. Do you think she is too old to be benefited by a change of living, or would it be apt to be injurious?" An extract from a letter which came in the same mail, from John Calvert, Reaboro, Ont., a farmer and bee-keeper, will answer these questions best.

"I have suffered greatly for years from rheumatism in shoulders and back, and my eyes have troubled me. For four months I have been following Health Hints, and I am happy to report that I am free from those pains now, and my eyesight is all right. I used to suffer so I could not sleep nights. Now I have better health than I ever had before — am able to do a good day's work in the bush, chopping and sawing logs, although I am past 76. God bless the *Practical Farmer* for teaching people how they can have comfort while on earth, and stay many years longer than they otherwise would." Friend Calvert lives much as we do at our home, and as you have often been advised to. Asthma can be cured and prevented, the same as rheumatism, and so can heart trouble, or any other ill, if one hasn't gone so far as to commit the really unpardonable sin against nature, which is almost never the case. But change in habits of living should be gradual. I should prefer myself to change and live in "comfort" for 30 or 40 years yet, rather than to suffer for 5 or 10 years and then pass away. There are causes for every disease in one's way of living, and the consequent condition of blood. Remove these causes, give the stream of life proper air, water, food, rest, etc., and nature will go right to work to cure. Failure will practically always come from your not doing your full part. Nature is all-powerful.

Some may object to the open fireplace on account of the waste of fuel; and as good stovewood is worth here $7.00 a cord this might well be considered. I am glad to tell you, however, that in clearing up a place for our "cottage in the woods" we dug out stumps and palmetto roots enough for fuel for *several* winters. With the beautiful light in our home, mentioned in another column, and the open fireplace, it is about the most comfortable and inspiring home that can be imagined

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HOW TO KEEP THE GIRL ON THE FARM, ETC.

Mr. A. I. Root:—I have always been deeply interested in the fascinating subject of bee-keeping, though I have never owned any bees. I am also interested in the question of how the farm girl can earn her own spending-money at home. Farm-press writers and farm papers devote a great deal of attention to the subject of "how to keep the boy on the farm" The father is advised to give the boy a calf, colt, pig, etc., or a share in the crop, to induce *him* to stay. But the boy's sister! Well, she generally "takes a business course," then goes to the city, and — only the guardian angel knows the sequel

Now, why can't *she* be furnished with an incubator and brooder, a canning-machine, and a stand of bees? Then *she* can start her own bank account, take "a course in business" right on the farm, and stay with her mother.

"We learn to do by doing;" and any average farm-girl could acquire a practical business training right at home, provided she has any money of her own to handle.

I already own two hundred-egg incubators and two hundred-chick brooders, earned with my pen. I also own a No. 1 modern canner, and both are money-makers.

After reading that cow peas are the thing for bee-pasture I am eager to add bees to my present combination, poultry and canning, because I live in a section where cow peas are grown very largely, I raise them for my poultry.

Until I read the inclosed article it had never occurred to me that their blossoms could be utilized for bee-pasture. But I shall lose no time in "passing on" this suggestion to farm and poultry papers that circulate where cow peas are grown. By so doing I hope to induce scores—yes, hundreds—of farm-girls to try bee-keeping. I am now 39 years old.

Fowler, Mo., Jan. 27. ANNIE HOFFARTH.

The following is the quotation alluded to, from the *Practical Farmer:*

Our principal money crop for the coming season will be, perhaps, unlike any the majority of Experience Pool readers have in mind. As in the past, the production of comb honey will be our specialty, and other crops will be planted chiefly for their bloom. Of these the cow pea will rank first. While many think that crops planted for the bees can not be made profitable, we find it decidedly otherwise. If the bees winter as well as usual, we expect to have something over 100 colonies another season, which ought to give us no less than 15,000 lbs. of marketable honey. Although prices may not hold up as during the past year, enough colonies will be run to make up the difference. Many localities are not suitable for exclusive bee-keeping, and the men who are able to make a successful vocation of the business are still fewer. Hence we would advise any one contemplating the field, with that object in view, to move cautiously. We did not enter the business on an extensive scale, nor with any flourishes, but with a few colonies only. As each year demonstrated that no other part of our farming was paying so well as the bees, we gradually made the production of honey our principal business.

Ft. Smith, Ark. LEO E. GATELEY.

There are two things in the above letter that commend themselves to me particularly—first, keeping the *girl* on the farm. Why, her letter makes me feel like paying her a visit. I want to see her incubators and that canning outfit; and I also want to raise my—"fur cap" to the lady who has the courage to come right out in print, say she is *almost* 40 years old, just as honestly and frankly as I can say "Friends, *I* am almost *seventy*." I presume she, as well as myself, will be able to surprise many people who grow old before their time. A letter just under my hand closes with these words: "With best wishes that your Century Club may not lose you before the prescribed time," etc. Dear friends, it *is* a "century club" we are enlisting in, and not an "Ananias club."

POULTRY DEPARTMENT

CONDUCTED BY A. I. ROOT.

INDIAN RUNNER DUCKS.

The original home of these was in India; but they are now extensively grown in England, and were introduced into the United States about fifteen years ago, where they have won for themselves a high position in the Eastern markets. These birds are very quick-motioned, and it is possible for them to move very rapidly. Their legs are very strong, and are set well back, so that the carriage is nearly erect. There is no suggestion of the awkward waddle of the common duck, hence their name, "Indian Runner."

In color they are gray and white, and fawn and white. The drake has darker cheek-markings, presenting a most attractive appearance. Their standard weights are, drake, 4½ lbs.; duck, 4 lbs. These weights are not as great as those of the Pekins; but by good feeding they can be made to weigh 9 and 8 lbs.

The question is asked, "Will ducks disturb bees?" My ducks do not have free access to the hives; but the ducks are in the white-clover lots where the bees are thick, and I have never noticed any damage done to the ducks nor to the bee.

The Indian runners mature very rapidly, reaching market size in nine weeks. They require no swimming-water, but plenty for drinking purposes. They are great foragers, and find no small part of their food in the form of grubs and worms, which they delight in hunting in the grass and weeds.

As Mr. Root mentioned in his short article last year, the Indian Runners are very interesting little creatures to watch grow from the time that they are hatched until they are matured.

Mt. Gilead, O. KENT JENNINGS.

In regard to bees and ducks, while ours were raised almost right in our apiary, the ducks never meddled with the bees nor the bees with the ducks; but others have complained that (like chickens) they *sometimes* acquire the habit of "gobbling up" bees loaded with honey, and, if I am correct, we have had reports of bees stinging young ducks that got too inquisitive. I do not know that I ever got much more enjoyment out of a like investment than that setting of eggs gave me. While they were young the "neighboys" all liked to see them come around; but when grown up they made themselves so *much* "at home" everywhere we were obliged to dispose of them. They do not seem to bear confinement very well.

I have just learned from Mr. Jennings that he expects to issue soon a leaflet on the breeding, feeding, and raising of Indian Runner ducks

PARTRIDGES IN DOMESTICATION, ETC.

I am so crippled up with rheumatism that I can only roll around on a little three-wheeled wagon; and in the fall of 1906, in order to get out in the open air more, and to diversify my rather monotonous life, I took a notion to see what I could do toward feeding and gentling a bunch or two of partridges that were ranging in a lot a few hundred yards from the house. I got some hominy and sorghum seed, and scattered a few handfuls in the brush where the partridges were ranging, and in a few days the bunch of blue "top-knots" (there were just 20 in the bunch) found the feed, and from that time on through the winter until late in the spring the birds were always close around and ready for their feed. I had been feeding them but a short time when several bunches of "Bob White" partridges took to the feed also; so I went to feeding them in two places about 200 yards apart, so as not to have too many in one place; and all winter until late in the spring there were about 100 partridges feeding at the two places, and in a short time they all got so gentle that they would come up and eat while I was scattering out the feed. I always whistled like the Bob White partridge when I got near the feeding-places, and they soon caught on to the whistle and would come as fast as they could run from four or five different directions as soon as they heard the whistle, and some of them would fly and come if they were quite a way off when they heard the whistle.

Now, Mr. Root, you see you don't have to find partridge nests and then rob them of their eggs and then hatch them in your incubator to go into the partridge business, when it is so much better and easier to control them with feed; and, besides, whenever you go to robbing their nests and holding the young birds in confinement, right then one is violating the game law in this part of the world, and is subject to a fine.

Before I close this letter let me tell you what became of the birds. Well, I thought too much of my pet birds to let any one shoot them, and it is against the law to trap them at any time; so in the spring the bunches broke up into pairs and scattered off to build their nests to rear their young. The following fall six of the blue top-knot birds failed to raise any young, and came back for feed. Of course, I fed them some, and they were around the lots and feed-pens all winter. The top-knot variety finally all drifted off to the low hills; but at the present writing there are hundreds of the Bob Whites close around, and their center of attraction is a ten-acre sorghum-patch that has gone to seed, which never fails to hold them around.

Mr. Root, you ought to get some eggs of the ringneck English pheasant, and get them started around your "cabin in the woods." They are surely a pretty bird. The males have all the colors of the rainbow, and many more besides. I tried them here at my ranch several years ago, but none of them would locate in this part of the country. I believe they would locate in your section of the country. I set the eggs under a medium-sized hen, and let her raise them. The little birds soon get tame, and will run after any one who feeds them, and will eat out of their hands. I got my eggs from J. A. Durrell, of Pleasant Ridge, Ohio. He used to raise them by the hundreds in wire-netting inclosures. The young of the pheasant are great insect-eaters; and my experience is that they will nearly all die if kept in an inclosure where they can not get plenty of insects to eat.

D'Hanis, Texas. DAN POLK.

Friend P., I am very glad to know that somebody has succeeded so well in keeping partridges in domestication; but I am surprised to hear you speak of "Bob White" as if it were a variety of partridges. We have them here and also in Florida. I presume it is the same bird that calls out before a rain, "More wet, more wet." We have also quails in Florida, but they are rather smaller than those here in Ohio; but the partridges of Northern Michigan are a much larger bird than those here. In fact, one of the males when he comes strutting around their drinking-place comes pretty near being as large as a Brown Leghorn hen, especially when he makes his feathers stand up and shows fight if you do not go away. A neighbor near our home here in Medina had a flock of quail that he fed all one winter; but it kept him busy putting up notices warning hunters that those quail were his property just as much as the chickens around his barn. In fact, the quails came up and ate with the chickens all winter long when there were no strangers around to drive them away.

THE CHARACTER OF THE ENEMY WE ARE FIGHTING.

A few days ago a daily paper in the neighboring city of Akron, O., gave a clipping purporting to come from the Birmingham, Ala., *Daily News*. It told about the awful suffering that had been caused by wiping out the saloons. The statement was so astounding that one of our people sent the clipping to the Birmingham paper, asking for an explanation. A reply came at once from the editor, declaring that no such thing had ever appeared in his paper—that it was a string of falsehoods from beginning to end. When this report was presented to the Akron editor he very coolly replied that he *knew* it was a lie when he published it; but he said he was paid for putting it in just as it appears. It was an advertisement, even though it did appear in the reading-columns. Now, I do not know how many such editors there are in this land of ours; but may God speed the day when they shall be wiped off the face of the earth by another wave of public indignation like the wave that is just now driving out the saloons.

HIGH-PRESSURE GARDENING

By A. I. ROOT

Dear Sirs:—My attention was called to an article on page 1310, about alfalfa, in which you state "This knocks the bottom out of the argument that alfalfa should be cut before it blooms." Of course, we bee-keepers like to have alfalfa left to bloom; and the prevailing belief is that alfalfa should be allowed to bloom before being cut for hay. Now, the fact is, the first crop should be cut just before it blooms. This hay would be of higher feeding value then than if allowed to bloom. The alfalfa-plant would also start the new growth quicker. We cut the second crop, also, just before it comes to bloom, allowing the third crop to come in full bloom for the bees and seed. The alfalfa straw is fed to horses, cattle, and sheep. An acre of third crop to seed produces five gallons of extracted water-white alfalfa honey, extra fine. The seed yields from one to six bushels per acre. On other fields, hay only, we obtain four to five crops. All are cut just before the plant comes in bloom.

As I stated before, for the bee-keepers it is best to have alfalfa bloom for bee-pasture; but for hay value and the good of the alfalfa-plant, cut it just before it blooms. I know by experience.

I should judge by your article you were "playing" for the bee-keeper. Am I right, friend Root?

Thrashed buckwheat yielded 33 bushels per acre, and sold at 2¼ cts. I shall have about 100 acres of it next year. It is a good honey-plant, but I prefer alfalfa.

The writer has had all kinds of experience in cleaning up and getting in shape a run-down, weed-covered, and neglected farm of 300 acres, bought six years ago, at from $20 to $45 per acre. You can about form an idea of the condition that it is now in when I tell you that $60,000 was refused, without buildings, not even a fence-post on the place, as level as the floor. A part of this year's crop was 500 tons alfalfa hay, worth $11.50 per ton; 3089 bushels seed wheat at $1.00 to $1.25 per bushel; buckwheat seed at 2¾ cts. per lb.; alfalfa seed at $11.00 per bushel of 60 lbs.; vegetables and seeds, oats, honey, etc.

Hastings, Neb., Nov. 5. CHAS. WINKLER.

Many thanks, friend W., not only for your criticism, but for the report of your success. If you will look again on page 1310 you will find that our authority for the statement we made was based on statements made by Joseph E. Wing, who, without doubt, is the most successful grower of alfalfa in Ohio, and I think that perhaps a difference in locality may have had much to do with it. Since you mention it, I remember that T. B. Terry has always taught that timothy and clover, to be of most value to horses and cattle, should be cut much earlier than usual; and to prove his theory he fed a team of big work-horses for months and years on his "wilted grass," as his neighbors called it, without any grain whatever. Very likely this is true of alfalfa, although there seem to be extremes both ways. Mr. Wing seems to think (and he certainly ought to know) that alfalfa should not be cut too early, even for horses. Yes, we are bee-keepers, and we are interested in having alfalfa, buckwheat, and every other crop, managed in such a way as to favor the bees, not forgetting the interest and well-being of those who do not keep bees at all. I do not think you can consistently accuse the editors of GLEANINGS of being selfish as a rule in trying to teach improved agriculture in all its different lines.

ALFALFA IN DRILLS; EXPERIENCE FROM A WYOMING FARM.

Inasmuch as alfalfa is now being extensively grown over almost all of our land, from Maine to Florida, we think the following will be read (and I hope put in practice in the spring) with much interest:

I have read W. H. Jenkins' article on alfalfa in drills. I had previously read an article by him, in GLEANINGS IN BEE CULTURE, on the same subject, and have tried it on the so-called arid land of Wyoming. The land was plowed and harrowed for the first time this spring. I raked over a plot about 30 by 50 ft., and made drills some three inches deep in which I sowed the alfalfa seed, covering with a common garden-rake, and walking over the part sown to firm the ground. The seed sprouted and came up finely, and is now in bloom. The rows are 28 inches apart, and free from weeds. I had previously sown some broadcast alone, and some with oats, and harrowed it in. I have sown it broadcast and raked it in, and it has grown well every way; but I think the plan of drilling it in is a great improvement. I have sown it in drills running north and south, and in drills running east and west, and it seems to me the latter is the better way. D. M.

Arapahoe, Wyoming.

Replying to the above, the editor of the *Rural* adds:

Has any one noticed any difference? We drilled alfalfa, Aug. 17, on well-prepared soil at the top of a hill. The drills were made about 18 inches apart. The alfalfa came up in three days, and looks well at this time.

A KIND WORD IN REGARD TO THE TOBACCO COLUMN OF YEARS AGO.

If I were to undertake to put in print all the words that were received, especially those from the old veterans, at the recent National convention, it would take more space than we can spare just now. But there is one that certainly deserves mention. A very nice old gentleman took me by the hand and said he had been owing me a debt of gratitude and thanks for a great service I rendered him *twenty-eight years ago.* What do you suppose it was? Why, he said that through my talk and exhortations in our journal he was induced, twenty-eight years ago, to give up tobacco. His health improved right away. He felt that he was growing younger instead of older, and from that day to this he has felt that he owed me a debt of gratitude because of my earnest talks about *overcoming*—especially overcoming things that we *know* are bad habits. Not only has it given him a new lease of life, but he has been able to set a better example before his boys, but to encourage, perhaps, many others to give up a habit that always leads in the downward path instead of the upward one that leads from earth to heaven. I tell you there are some very good people away over there in Canada in the king's domains. I feel an especial interest in that locality because it was the home of our business manager, Mr. J. T. Calvert, before he came to the United States and married one of the "Root girls."

PROPOLIS FOR THE MANUFACTURE OF SHOE-POLISH, FURNITURE-POLISH, ETC.

Arthur M. Peck, Sand Lake, N. Y., informs me that a cousin of his some years ago made a preparation, mostly from propolis, that had wonderful "staying" properties for shining up shoes, harness, and other leather work, but that, like many inventors, he got after something else and dropped it. As most of you have had more or less experience in regard to the way propolis "holds on," I think you will agree with me that it ought to be collected and utilized. Quite a little has been said about the "beeswax finish" for houses. Well, will some one make a test and see if propolis added to the wax and turpentine will not make a harder or more lasting article for finishing up woodwork? How about a "furniture polish" containing propolis?